

PELVIPERINEOLOGY

A multidisciplinary pelvic floor journal

www.pelviperineology.org

*Official Journal of Australian Association of Vaginal and Incontinence Surgeons,
Integrated Pelvis Group, Perhimpunan Disfungsi Dasar Panggul Wanita Indonesia*

Editors

GIUSEPPE DODI - BRUCE FARNSWORTH

11th aavis annual
scientific meeting

INTERNATIONAL
PELVIPERINEOLOGY
CONFERENCE

Noosa, Sunshine Coast,
Australia

July 30 - August 1 2009

CONTENTS

35 *Editorial*

36 Pelvic Floor Digest

37 Recto Anal Repair (RAR): a viable new treatment option for high-grade hemorrhoids.
One year results of a prospective study ULRIKE SATZINGER, WOLFGANG FEIL, KARL GLASER

43 Cure of childhood urgency incontinence with a midurethral sling PETER PETROS

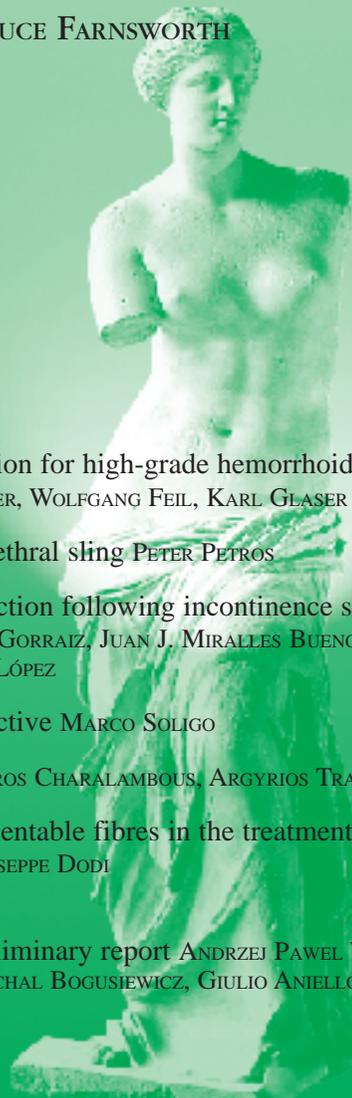
45 Retropubic urethrolisis and tape sectioning for obstruction following incontinence surgery.
Long-term results JESÚS ROMERO MAROTO, MANUEL ORTIZ GORRAIZ, JUAN J. MIRALLES BUENO,
LUIS GÓMEZ PÉREZ, JUAN J. PACHECO BRU, CRISTÓBAL LÓPEZ LÓPEZ

49 Complex pelvic problems - a multidisciplinary perspective MARCO SOLIGO

51 Impact of urinary incontinence on quality of life STAVROS CHARALAMBOUS, ARGYRIOS TRANTAFYLIDIS

55 The prebiotic effects of a new mixture of soluble fermentable fibres in the treatment
of chronic constipation LUCA AMADIO, ERICA STOCCO, GIUSEPPE DODI

59 The assessment of normal female urethral vascularity
with Color Doppler endovaginal ultrasonography: preliminary report ANDRZEJ PAWEŁ WIECZOREK,
MAGDALENA MARIA WOZNIAK, ALEKSANDRA STANKIEWICZ, MICHAŁ BOGUSIEWICZ, GIULIO ANIELLO SANTORO,
TOMASZ RECHBERGER, JAKOB SCHOLBACH



aavis



Vol. 28
N.2
June 2009

Rivista Italiana di Colon-Proctologia
Founded in 1982

PELVIPERINEOLOGY

A multidisciplinary pelvic floor journal

www.pelviperineology.org

*Official Journal of Australian Association of Vaginal and Incontinence Surgeons,
Integrated Pelvis Group, Perbimpunan Disfungsi Dasar Panggul Wanita Indonesia*

Editorial Board

JACQUES BECO, *Gynaecologist, Belgium*

DANIELE GRASSI, *Urologist, Italy*

FILIPPO LATORRE, *Colorectal Surgeon, Italy*

BERNHARD LIEDL, *Urologist, Germany*

MENAHEM NEUMAN, *Urogynaecologist, Israel*

OSCAR CONTRERAS ORTIZ, *Gynaecologist, Argentina*

FRANCESCO PESCE, *Urologist, Italy*

PETER PETROS, *Gynaecologist, Australia*

RICHARD REID, *Gynaecologist, Australia*

GIULIO SANTORO, *Colorectal Surgeon, Italy*

MARCO SOLIGO, *Gynaecologist, Italy*

JEAN PIERRE SPINOSA, *Gynaecologist, Switzerland*

ANGELO STUTO, *Colorectal Surgeon, Italy*

MICHAEL SWASH, *Neurologist, UK*

VINCENT TSE, *Urologist, Australia*

RICHARD VILLET, *Urogynaecologist, France*

PAWEL WIECZOREK, *Radiologist, Poland*

CARL ZIMMERMAN, *Gynaecologist, USA*

Editorial Office: LUCA AMADIO, ENRICO BELLUCO, PIERLUIGI LUCIO, LUISA MARCATO, MAURIZIO SPELLA
c/o Clinica Chirurgica 2 University of Padova, 35128, Padova, Italy

e-mail: editor@pelviperineology.org

Quarterly journal of scientific information registered at the Tribunale di Padova, Italy n. 741 dated 23-10-1982

Editorial Director: GIUSEPPE DODI

Printer "La Garangola" Via E. Dalla Costa, 6 - 35129 Padova - e-mail: info@garangola.it

This issue of Pelviperineology will be the last one printed before the 2nd Joint International Pelviperineology Conference at the end of July. The Organising Committee and the Executives of the Australian Association of Vaginal and Incontinence Surgeons as well as the International Collaboration of the Pelvic Floor and the International Pelvic Floor Dysfunction Society invite you to attend the 2nd International Pelviperineology Congress at Noosa on the Sunshine Coast of Australia between July 30th and August 1st 2009. This conference aims to continue the momentum of an outstanding meeting in Padua and Venice in 2008. Yet again we aim to help clinicians who aspire to a multidisciplinary approach in the management of pelvic problems take the first step to widen their horizons by communicating with their peers and colleagues from other specialties.

The organising committee has tried to ensure a good representation from all specialties and many different opinions are represented by the speakers invited. The program is diverse and comprehensive. There will be a special focus on imaging with international and local Australasian experts coming together to discuss a range of topics. Once again there will be a number of industry symposia and specialised workshops catering to specific topics of interest. There will be a practical workshop on Sacral Neuromodulation, Integral Theory and TFS, Practice Audit, Vaginal sacrocolpopexy and Pelvic Floor Ultrasound. In our video festival submitted videos will be shown on a continuous loop during the meeting and repeated so that delegates will have the opportunity to see a particular video at another time if it conflicts with a part of the program that they did not want to miss.

Live surgery will be performed at the Sunshine Coast Private Hospital and transmitted live to the Sheraton Noosa Ballroom. All activities will be held in the fantastic conference centre at the Sheraton Noosa enabling delegates to move easily from one session to another. A large trade exhibition will enable the latest developments from industry to be viewed.

The meeting in Noosa is a wonderful opportunity to experience the natural wonderland of the Sunshine Coast. As well as the social events that makeup the official program there will be opportunities to play golf in some of Australia's most celebrated golf courses and visit the spectacular beaches, rainforests and national parks.

The meeting in Noosa will be a special opportunity for our society to become a truly multidisciplinary group by voting on a move to revamp the AAVIS constitution and change our name to reflect our new reality. AAVIS is the first international pelvic floor society to begin the process of fully integrating colorectal surgeons with an interest in pelvic function into what has traditionally been known as urogynaecology. The new subspecialty of Pelviperineology has begun life with a commitment to openness, science and respect for other people's opinions. By constantly seeking the truth and the best treatments for our patients we can only improve the standards of our own practice. Adherence to these principles has led to some wonderful meetings in the last few years and we hope that this will continue into the future.

Pelviperineology has been published by a family owned printing company in Italy since 1982. We are now an open access journal available for free on the internet and as part of our plans to modernise and improve our system we have recently changed our Instructions for Authors. It is no longer necessary to supply a copy of your submitted papers in triplicate on paper. We are happy to accept your email submissions but ask that diagrams be submitted as separate jpg files.

The editors and editorial committee hope you enjoy this edition of the journal and look forward to seeing you in Noosa.

THE EDITORS

This section presents a small sample of the *Pelvic Floor Digest*, an online publication (www.pelvicfloordigest.org) that reproduces titles and abstracts from over 200 journals. The goal is to increase interest in all the compartments of the pelvic floor and to develop an interdisciplinary culture in the reader.

FORUM

A nomenclature of nomenclature: the sources of terminologic uncertainty and confusion and the value of communication. *Cunningham SC, Klein RV, Kavic SM. Arch Surg. 2009;144:104.* Nuance, subtlety and poetry are valuable forms of productively ambiguous communication, a wellspring of affective communication. The unambiguous, scientific, technical language is affectively flat. The successful surgeon should be comfortable in both worlds: univocal and technically precise in words and actions, but able to navigate communications with patients and families. "If terms be incorrect, then statements do not accord with facts; and when statements and facts do not accord, then business is not properly executed" says Confucius, and Wittgensteins' opinion is that "a main source of our failure to understand is that we do not command a clear view of the use of our words".

Understanding results. *Breau RH, Dahm P, Fergusson DA, Hatala R. J Urol. 2009;181:985.* In this users' guide to the urological literature a guidance is provided on how measures of effect and precision should be interpreted and used in the evidence-based practice of urology.

The future of medical informatics. Some perspectives of intra- and inter-institutional information systems. *Winter A. Methods Inf Med. 2009;48:62.* Medicine and health care need medical informatics as a scientific, researching discipline and medical informatics requires multidisciplinary.

Data protection in a digital age. *Lancet 2009;373:518.* Electronic health records become the norm, the potential for security breaches is likely to increase. A key aim of the rule is to protect patients' privacy while enabling the flow of health information to aid research and care. President Barack Obama plans to make all medical records digital within 5 years.

Workforce development in geriatric home care. *Hayashi J, DeCherrie L, Ratner E, Boling PA. Clin Geriatr Med. 2009;25:109.* Within two decades several million more individuals in the United States with functional impairment and seriously ill health will need home health care. This article discusses workforce development, which is a critical issue for future planning. A combination of actions is needed, including educational programs, changes in financial incentives, and changes in the culture and practice of health care, to make the home the primary focus of care for these vulnerable, underserved individuals.

Elder abuse and neglect: when home is not safe. *Abbey L. Clin Geriatr Med. 2009;25:47.* The prevalence and seriousness of elder abuse and neglect require the collaboration of health care professionals with many other disciplines for adequate assessment and intervention, and the home visit provides a unique opportunity for the visitor to evaluate risk factors. Domestic violence persists into late life.

Regulation of human stem cell research in Australia. *Then SN. Stem Cell Reviews 2009 Feb 13 Epub.* As human stem cell research has progressed, authorities have had to deal with the ongoing challenges of regulating the fast moving field of scientific endeavour. Australia's past and current approach to regulating the use of embryos in human embryonic stem cell research provides an insight into how this country may continue to adapt to future challenges.

The ethical challenge of surgical innovation. *Palma P, Rosenbaum T. Int Urogynecol J Pelvic Floor Dysfunct. 2009;20:375.*

Development of the functional recovery index for ambulatory surgery and anesthesia. *Wong J, Tong D, De Silva Y et al. Anesthesiology 2009;110:596.* It is increasingly important to evaluate patients' recovery after ambulatory surgery. The authors developed the Functional Recovery Index (FRI) to assess postdischarge functional recovery for ambulatory surgical patients involving four phases: item generation, item selection, reliability, validity testing and acceptability. A draft questionnaire assessing functional recovery of ambulatory surgical patients was tested and revised. Items were selected through testing endorsement frequency, factor analysis and testing internal consistency.

1 – THE PELVIC FLOOR

Beyond NOTES: randomized controlled study of different methods of flexible endoscopic hemostasis of artificially induced hemorrhage, via NOTES access to the peritoneal cavity. *Fritscher-Ravens A, Ghanbari A, Holland C et al. Endoscopy. 2009;41:29.* As significant hemorrhage is a likely complication during natural orifice transluminal endoscopic surgery (NOTES) procedures, 3 different prototype devices (involving endoscopic suturing, monopolar forceps, and forced argon plasma coagulation [FAPC]) for treatment of acute bleeding in a survival animal model were tested. The new prototype FAPC device allowed hemostasis of notable bleeding from a major vessel.

Bicycle saddle pressure: effects of trunk position and saddle design on healthy subjects. *Carpes FP, Dagnese F, Kleinpaul JF et al. Urol Int. 2009;82:8.* There is a common belief that seat pressure during cycling can compress specific neurovascular tissues over the perineum leading to genital pathologies. Using the 'holed' saddle the trunk forwards shift seems to affect the values of saddle pressure for men but not for women.

Validation of Spanish versions of the Pelvic Floor Distress Inventory (PFDI) and Pelvic Floor Impact Questionnaire (PFIQ): a multi-center validation randomized study. *Omotoshio TB, Hardart A, Rogers RG et al. Int Urogynecol J Pelvic Floor Dysfunct. 2009;20:623.* Spanish versions were developed using back translation. Validation was performed by randomizing bilingual women to complete the Spanish or English versions of the questionnaires first, and 44 bilingual subjects were required to develop a valid and reliable version.

Patient-centered treatment goals for pelvic floor disorders: association with quality-of-life and patient satisfaction. *Bovbjerg VE, Trowbridge ER, Barber MD et al. Am J Obstet Gynecol. 2009;200:568.e1.* Incontinence Impact Questionnaire, Urogenital Distress Inventory, Incontinence QoL Scale, Patient Health Questionnaire, and SF-12 Health Survey were completed by 90 women: 12-month mean goal attainment was moderately correlated with PFD-specific measures of QoL but less strongly with depression and general health status, and differed significantly among those who were more or less satisfied.

2 – FUNCTIONAL ANATOMY

Development of the enteric nervous system: bringing together cells, signals and genes. *Burns AJ, Pachnis V. Neurogastroenterol Motil. 2009;21:100.* The enteric nervous system (ENS), the intrinsic innervation of the gastrointestinal tract that controls essential functions such as motility, secretion and blood flow, comprises a complex networks of neurons, glial cells and ganglia derived from neural crest cells that undergo extensive migration, proliferation and differentiation. The studies on the ENS development will help to establish novel therapeutic strategies for restoring or repairing malfunctioning enteric neural circuits prevalent in numerous gastrointestinal diseases.

The use of local 17beta-oestradiol treatment for improving vaginal symptoms associated with post-menopausal oestrogen deficiency. *Yumru AE, Bozkurt M, Inci Co_kun E, Baykan G. J Int Med Res. 2009; 37:198.* The effects of local therapy with 17beta-oestradiol on the vaginal mucosa and endometrial thickness were studied in 35 post-menopausal women, observing an improvement of the signs and symptoms of vaginal atrophy without endometrial stimulation. A safe and effective alternative is offered to systemic hormone replacement therapy.

The PFD continues on page 42

Recto Anal Repair (RAR): a viable new treatment option for high-grade hemorrhoids. One year results of a prospective study

ULRIKE SATZINGER^(*) - WOLFGANG FEIL^(**) - KARL GLASER^(***)

(*) Krankenhaus St. Josef, Vienna

(**) Evangelisches Krankenhaus, Vienna

(***) Wilhelminenspital, Vienna

Abstract: Recto Anal Repair (RAR) is a new, minimally-invasive treatment option for high-grade hemorrhoids which combines HAL (Hemorrhoidal Artery Ligation) and “lifting” of the hemorrhoidal prolapse, known as a mucopexy, in one procedure. Our prospective study evaluates both the early and long-term clinical outcomes of this procedure. 83 patients (43% female, 57% male, mean age 56 years (range 20-83)) with high-grade hemorrhoids (90% grade III, 10% grade IV) were treated using the RAR technique (equipment: A.M.I. GmbH, Austria) by the same surgeon in two different hospitals. Follow-up was carried out at 1 week, and then at 1, 3, 6 and 12 months, whereby clinically relevant parameters such as hemorrhoidal symptoms and re-prolapse were recorded and the spatial distribution of treated arteries analysed.

Results: The number of patients showing relief of hemorrhoidal symptoms at 12-month follow-up was high. Bleeding was resolved in 89% of the patients, itching in 95%, burning in 100% and soiling in 100%. The recurrence of prolapse at 12 months was low, with no re-prolapse being recorded in 89% of the patients. Patient satisfaction was consistently high (>90%) at all follow-up intervals and the complication rate was low. In addition, data indicated that course of the branches of the superior rectal artery (SRA) into the corpus cavernosum recti (CCR) is unpredictable and varies considerably from patient to patient. Recto Anal Repair not only has several perioperative advantages – minimally-invasive surgery, low pain levels and no major complications – but also offers prolonged relief for all hemorrhoidal symptoms and for re-prolapse. RAR is an effective form of treatment for high-grade hemorrhoids.

Key words: Hemorrhoids; Rectal arteries; Hemorrhoidal Artery Ligation; Hemorrhoidectomy; Doppler.

INTRODUCTION

Over the last decade, several novel treatment options have been developed for high-grade hemorrhoids with the intention of minimising the drawbacks of what is considered today to be the gold-standard, the conventional hemorrhoidectomy. Two of these new methods are HAL (Hemorrhoidal Artery Ligation)¹ and stapled hemorrhoidopexy.² Both techniques have shown potential benefits for high-grade hemorrhoids, particularly with regard to the perioperative parameters and at least partially also with respect to long-term results. However, both also have drawbacks still requiring improvement. The stapled hemorrhoidopexy has a much higher re-prolapse rate than the gold standard, and the resolution of hemorrhoidal symptoms is lower.³ In addition, severe complications after stapled hemorrhoidopexy are known and have also been reported in literature.^{4,6} The increased re-prolapse rate for high-grade hemorrhoids is also shared by the HAL method.⁷ However this shortcoming has more recently been addressed by the advent of RAR, a technique which is an extension of the HAL method. Bearing in mind that the HAL method appears to provide effective relief of symptoms,⁷⁻¹⁵ and not one major complication has been reported in literature so far, we decided to pursue a study on the effectiveness of RAR.

The purpose of this prospective study was to observe how the clinically relevant parameters of high-grade hemorrhoids developed over a period of one year subsequent to treatment with RAR.

THE RAR CONCEPT

The concept of Doppler-guided hemorrhoidal artery ligation (DG-HAL) to treat symptomatic hemorrhoids was first reported by Morinaga¹ in 1995. This method was based principally on the theory of a misbalance between the flow of blood to and from the hemorrhoids. To restore this balance, Morinaga proposed reducing the supply of blood from the rectal arteries to the hemorrhoidal cushions.

Morinaga's theory of increased arterial inflow was supported by Aigner's¹⁶ recent findings about changes in mor-

phology, and blood flow of rectal arteries in the muscular wall layers. The study has shown a correlation between the appearance of hemorrhoids, and an increased caliber and arterial blood flow in the terminal branches of the superior rectal artery. He concludes that his study provides strong evidence that the supply of arterial blood to the corpus cavernosum recti (CCR) is relevant to the development of hemorrhoidal cushions. The vascular dilation and increased blood flow suggest that there might exist an increased arterial inflow rather than a venous stasis or outflow problem supporting the development of hemorrhoids. In addition to these findings, a cadaver study by Schuurman¹⁷ examined the vascular anatomy of the CCR in the inner wall of the distal rectum. On average, some eight arteries down to a size of 0.2 mm in diameter were seen in the distal rectum, all originating from the superior rectal artery. Schuurman's study shows that the distribution patterns of the arterial structures differ substantially from the classic 3, 7 and 11 o'clock descriptions: the course of the submucosal vessels and their length, diameter and number differ from patient to patient, indicating that the arrangement of the rectal submucosal arteries cannot be generalised.

The HAL method requires the use of a proctoscope with a Doppler transducer attached (Fig. 1). This Doppler transducer is used to detect the location and depth of arterial structures lying approximately five to six centimetres proximal to the anus. All arteries below the Doppler transducer with flow in the cranio-caudal direction (even if only in part) can be detected. A small fraction of arteries running perpendicular to the detection direction will theoretically not be included. The equipment (A.M.I. HAL II Doppler) (Fig. 2) displays the depth of the detected arteries. This enables that structures located in very deep layers (deeper than 8-10 mm) can be excluded. Once an artery is detected, it will be ligated with an absorbable 5/8 suture. The arteries' arbitrary branching pattern means it is essential to make the ligation very close to the Doppler transducer. If the ligation is too high, there is a greater risk of missing the artery. Therefore the distance between the Doppler transducer and the ligation window of the equipment used must be kept to a minimum.



Fig. 1. – Proctoscope with Doppler (a) and adjacent ligation window (b).



Fig. 2. – HAL Doppler Equipment (A.M.I.) with display of depth of arteries.

The proctoscope is inserted, and the arteries are detected and then ligated with a figure-of-eight stitch. The proctoscope remains inserted at the same depth while the handle is turned gradually to detect and ligate the arteries one by one until the handle has turned a full circle. The handle can then be pulled back approximately one centimetre, and a second rotation made to find additional arteries.

The RAR method, an extension of the HAL method, is a two-step procedure first described by Hussein¹⁸ in 2001. The first step is the artery ligation (HAL) as described above, and the second step is a mucopexy: RAR = HAL + Mucopexy. The mucopexy secures the hemorrhoidal prolapse into the anal canal. Technically, the mucopexy begins with the placement of a running suture that starts proximally and ends distally (Fig. 3). The distal part of the hemorrhoid is then pushed back into the anal canal and the hemorrhoid is secured back in place by knotting the two ends of the absorbable suture. This second step of the RAR procedure is therefore also known as anal lifting. The equipment used in our study offers a feature that allows controlled opening of the operation window, starting proximally and ending distally, and therefore prevents mucosa from falling into the whole working area at once. With unobstructed vision, the first firm stitch can be placed proximally at a distance of about six centimetres from the anus. We tend to make two proximal stitches and to place a knot at that position. By rotating the handle, the working window can then be opened step by step to access more distal parts. The continuous suture can be made stitch

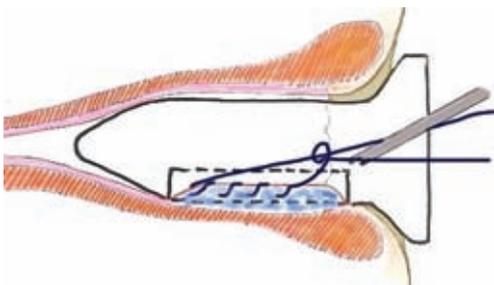


Fig. 3. – Mucopexy to lift hemorrhoidal prolapses.

by stitch, without distal parts of the mucosa falling into the working area while treating more proximal parts. The running suture is completed some 5 to 8 mm above the dentate line to ensure pain levels remain low. Once the most distal stitch is made, the 5/8 needle is cut off and the end of the suture knotted to the other end which remained proximal. Using the index finger or a knotpusher, the knot is pushed upwards and the prolapsing mucosa pulled back into the anal canal.

The mucopexy is based on the theory that hemorrhoidal disease stems from an increased laxity of the connective tissue in the CCR. Depending on the actual prolapse positions, multiple running sutures can be placed to lift all prolapsing hemorrhoids. After four to six weeks, the sutures have been resorbed, and scar tissue remains in the treated parts of the corpus cavernosum recti.

By ligating the arteries using the HAL method, and subsequently carrying out step two of the RAR procedure, the mucopexy, the blood inflow to the hemorrhoidal cushions is reduced. The widespread network of arteries is partly blocked, however the remaining arteries still provide more than enough blood. Necrosis of the CCR has never been reported in the relevant literature, nor did it occur in our series of patients. Also of note is the fact that hemorrhoidal tissue, and therefore the anorectal function as shown by Walega,¹⁹ are well preserved.

PATIENTS AND METHODS

This study comprises results from 83 patients who underwent the RAR procedure (Tab. 1). At the current time, 1-year follow-up has been carried out on 44 patients. At all intervals (1 week, 1, 3, 6 months and 1 year) follow-up data was collected during a clinical examination of each patient by the same surgeon. A prospective study questionnaire was created prior to this non-randomized study to measure the resolution of hemorrhoidal symptoms and hemorrhoidal prolapse, as well as pain levels. In addition, surgery was documented in detail, photographs were taken of each patient prior to and after surgery, and patient satisfaction was recorded at all follow-up intervals.

Patients with grade II hemorrhoids are treated with HAL. Grade III and IV hemorrhoids are treated with the RAR procedure. This study includes patients with grade III and IV hemorrhoids only (Tab. 2). Surgery was carried out by the same surgeon in two different hospitals.

RAR was performed under anaesthesia (local or spinal), depending on the patient's preference, and patients were placed in the lithotomy position (Tab. 3).

Perioperative Data

Average operating time did not vary greatly between those patients with spinal anaesthesia (26 minutes) and those with

TABLE 1. – Sex of patients.

Female	n = 36 (43 %)
Male	n = 47 (57 %)

TABLE 2. – Goligher classification of hemorrhoids.

Grade III	n = 75 (90 %)
Grade IV	n = 8 (10%)

TABLE 3. – Anaesthesia.

Spinal	n = 31 (37 %)
General	n = 52 (63 %)

general anaesthesia (27 minutes), nor did the pain levels. On the whole, pain levels recorded for RAR are comparatively low.^{9, 11, 23} In our series, 25% of the patients had no further need for analgesics after the day of surgery, 49% stopped taking them between first and fifth postoperative day and 22% needed analgesics for six to ten days after surgery. Only three patients (4%) needed analgesics for more than 10 days. This may have to do with thrombosis of the hemorrhoids that has been described for a small percentage of patients,^{7, 10, 20, 21} two of which occurred in our series. 87% of patients were hospitalised for three days, which is typical for the Austrian healthcare system, 10% of patients left the

TABLE 4. – Number of ligations.

	Grade III	Grade IV
3	5	1
4	4	2
5	12	1
6	18	2
7	20	1
8	7	1
9	4	0
≥ 10	5	0

TABLE 5. – Number of mucopexies.

	Grade III	Grade IV
1	5	0
2	7	0
3	36	2
4	18	4
≥ 5	9	2

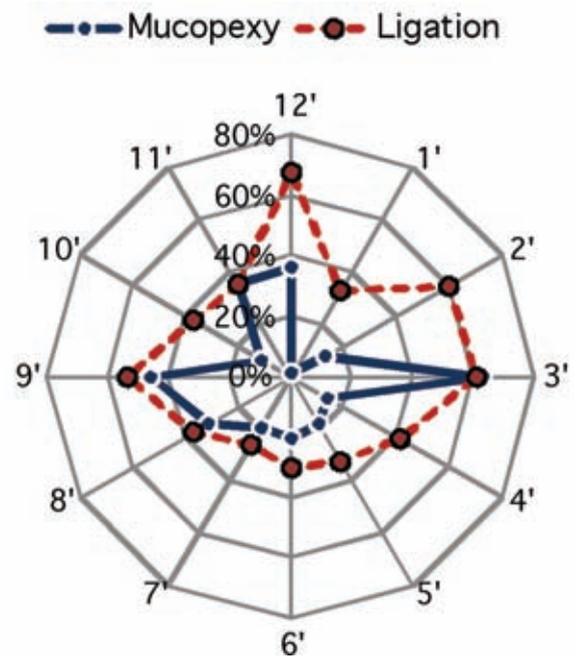


Fig. 4. – Position of ligation and mucopexy.

hospital on day two, two patients stayed for four days and one patient remained for longer than four days in hospital.

On average, six ligations were placed and followed by three mucopexies. The exact figures can be seen in Tables 4 and 5.

In our study, we also observed the positions at which ligations were placed and the positions at which a mucopexy was performed. Our data recorded for the ligation positions confirms the anatomical findings of Schuurman and Aigner,^{16, 17, 22} which indicated that the position of the rectal arteries is unpredictable. Ligations were often made at every clock posi-



Fig. 5. – Photos taken before and after RAR treatment, the two sample cases.

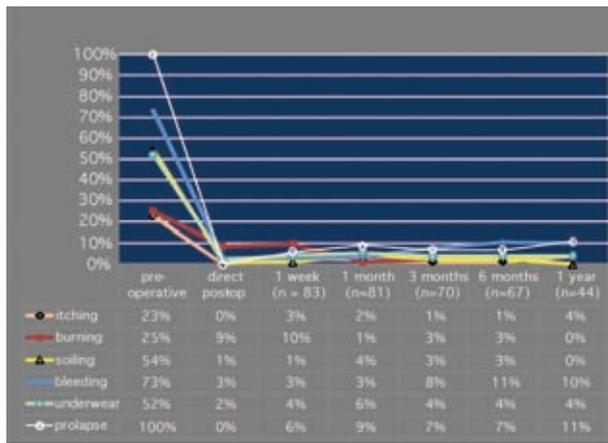


Fig. 6. – Relief of symptoms and prolapse.

tion. On average, we found that the probability of finding an artery in every single position was 41% (range of probabilities 26% to 67%). There were no correlations found between the patients. However, our study did show that the mucosa prolapsed in three particular positions more than elsewhere. These positions are 3, 8/9 and 11/12 o'clock (Fig. 4).

Visually, the effect of the RAR procedure is most convincing, as can be seen in the two sample cases (Fig. 5). While maximum shrinkage of the hemorrhoids with HAL occurs some 6 to 8 weeks after treatment, the mucopexy carried out during the RAR procedure ensures an immediate visual improvement. The hemorrhoidal cushions still undergo the same shrinking process over 6-8 weeks as with ligation alone, however the lifting of hemorrhoids back into the anal canal dominates in terms of prolapse treatment.

Results of 1-year follow-up

All patients treated in our study were suffering from either grade III or IV hemorrhoids. Therefore viewed objectively, the most common problem prior to surgery was a hemorrhoidal prolapse (by definition 100%). However, the problems reported by the patients prior to the operation only included prolapse in 55% of the cases. The other most common subjective problems included bleeding (73%), soiling (54%), burning (25%) and itching (23%). The question put to the patients regarding “dirty underwear” was already covered to some extent by the question regarding soiling. However in case of any misunderstandings regarding the term soiling, we chose to ask the additional question regarding underwear.

The relief of symptoms over time shows the effectiveness of the RAR method. Bleeding was the symptom that recurred the most frequently (Fig. 6).

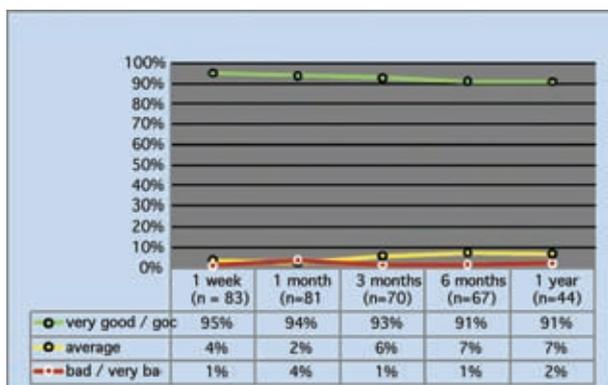


Fig. 7. – Patient satisfaction.

Complications after 83 RAR procedures included the formation of one fissure, one event of postoperative bleeding (which can most likely be attributed to an existing case of diverticulitis), perianal thrombosis in two cases, one case of fever above 38°C, and three cases of urinary retention that needed catheterization. The urinary retention can most likely be attributed to the spinal anaesthesia. From a total of 276 mucopexy sutures, five sutures ruptured the mucosa in part or fully, resulting in one re-operation three months after the initial procedure. We also experienced two abscesses (16 days and 5 weeks postoperatively). These occurred in patient numbers 81 and 82, and so were well beyond the learning curve. Because this complication has seldom been published, we reviewed our surgical regimen and considered a connection with single-shot antibiotics that we didn't use in our series. Now we do it too. Discussions with other experienced centres indicated that single-shot antibiotics are often used. Out of all the patients treated in our RAR series and additional patients treated with HAL, there was not one who suffered from a major complication either during or after surgery.

The relief of prolapse after RAR was of particular interest due to a novel technique used. All the data recorded was gathered during personal follow-up visits to the ordinationclinic. There, the surgeon used a proctoscope to examine each patient for a recurring prolapse. Recurrent prolapse was diagnosed in five patients at 12 months, however the size and position of the prolapse at that time substantially differed from the prolapse recorded pre-operatively. Out of 44 patients followed up at 12 months, three patients were suffering from a de-novo prolapse at a position that was different from the pre-operative positions. The two other patients suffered recurrences at a position that had been surgically treated. One of these patients will undergo a RAR reoperation, the second patient developed the recurrence between 3 and 6 months after the RAR treatment and has continued to live with the small residual prolapse for over a year without requiring reoperation. All re-prolapses after RAR are clearly smaller than those occurring preoperatively.

Patient satisfaction was measured at all intervals on a 5-point scale. As shown in the patient satisfaction chart, the very positive levels remain constant over the full follow-up period (Fig. 7).

DISCUSSION

The RAR technique is based on two parallel concepts that explain the development of symptomatic hemorrhoids: A) increased arterial blood supply to the CCR¹ and B) increased laxity of the rectal mucosa.^{2,4} Regardless of the reason for the hemorrhoidal disease, the RAR operation deals with both in an easy to learn, minimally invasive procedure.

The fact that the patients in this study were bothered more preoperatively by the hemorrhoidal symptoms (e.g. bleeding, itching etc.) than by the prolapse highlights the importance of those ligations carried out carefully during the HAL procedure. In our series, bleeding one year after surgery was observed in a higher number of patients than reported in other RAR studies.^{21, 23} If our results are compared with the data from Theodoropoulos and Zagriadskiy (3.5% and 1.4% bleeding respectively at the final follow-up), it can be seen that we placed significantly fewer ligations per patient. The bleeding reported by our patients during follow-up was in many instances minimal, with one patient reporting one instance of blood on the toilet paper every two weeks after defecation. There is not one patient in our series who has dropping blood after RAR on a regular basis.

TABLE 6. – Comparison of results from different treatment options for high-grade hemorrhoids.

	n	follow-up	hemorrhoidal symptoms present	persistent bleeding	persistent pruritus ani	persistent pain	fecal urgency	persistent prolapse	further surgeries (not peri-operative)
stapled hemorrhoidectomy [LIT]	174	7-14 months (median)	22,4%	14,9%	8,0%	8,7%	10,2%	10,2%	7,3%
conventional surgery [LIT]	188	7-14 months (median)	14,1%	11,7%	11,1%	10,4%	10,7%	2,2%	3,2%
RAR: Theodoropoulos [LIT]	37	15 months (average)	4,0%	1,4%	no data	no data	no data	2,2%	2,7%
RAR: Zagryadskiy [LIT]	85	10 months (average)	9,4%	3,5%	0,0%	0,0%	0,0%	1,2%	no data
RAR: our series	44	12 months (minimum)	no data	11,4%	4,8%	no data	0,0%	11,4%	2,3%

All together, RAR clearly improves the clinical outcome for residual prolapse compared to HAL,⁷ yielding the conclusion that the additional mucopexy has a positive effect.

Our study data shows that the position of the rectal arteries (the branches of the superior rectal artery) is not predictable. Therefore use of the Doppler ultrasound is essential to the procedure. Our data based on 83 patients treated for high-grade hemorrhoids confirms neither the traditional assumptions that the arteries are present at 3, 7 and 11 o'clock, nor other authors' recommendations to ligate at set positions - namely at odd hours 1, 3, 5, 7, 9 and 11 o'clock - where they claim the terminal branches of the SRA were always detected in series of several hundred patients.²⁴

²⁵ Instead our study data closely correlates with Schuurman's recent anatomical findings from macroscopic cadaver examinations and serial sectioning of cadavers.

We observed in our study that the visual hemorrhoidal prolapse subsequently treated with the mucopexy was predominant at three positions: 3, 8/9 and 11/12 o'clock. We found no correlation between the position of the outer prolapse and the internal location of the arteries.

Comparison of hemorrhoid treatment options

Today, the conventional hemorrhoidectomy is still considered to be the global gold standard procedure for high-grade hemorrhoids. In light of the shortfalls of this procedure, newer techniques including the RAR procedure have been developed. To this date, only a limited number of publications concerning RAR have been available. In 2008, Theodoropoulos²³ first published results from 15-month follow-up of RAR patients, and this was followed in the same year by a publication by Zagryadskiy²¹ with 10-month follow-up. As does our study, both of these studies include grade III and grade IV hemorrhoids only. We grouped our data with the data from these two studies, and then compared this group with the results for conventional hemorrhoidectomy and stapled hemorrhoidopexy published in a Cochrane Analysis. Although there is some variance in the study parameters, and the comparison is therefore not exact, it is still able to provide us with an initial indication as to which parameters may be most positively affected by the RAR procedure.

Jayaraman's Cochrane Analysis³ compared patients treated conventionally with patients treated by means of stapled hemorrhoidopexy. Data from Shalaby²⁶ was excluded in Table 6 for two reasons: firstly, the data was also excluded several times in the Cochrane Analysis because Shalaby's publication had been identified as being potentially subject to bias, and secondly, the data also includes grade II hemorrhoids and differs therefore from the other data based solely on treatment of high-grade hemorrhoids.

Table 6 shows that the resolution of hemorrhoidal symptoms (bleeding, pruritus ani, pain) with RAR is considerably higher than for conventional hemorrhoidectomy and stapled hemorrhoidopexy. This effect can be attributed to the ligation of the arteries of the CCR. Average re-prolapse rates after RAR lie somewhere between the rates for other

treatment options. While two of the studies have results as good as those for conventional hemorrhoidectomy, the results from our series are closer to those for stapled hemorrhoidopexy.

CONCLUSION

The present study confirms that the RAR procedure is a very effective technique for treatment of high-grade hemorrhoids. RAR offers a variety of advantages, including improved treatment of symptoms, lower pain levels, shorter hospital stays, less time off work and high patient satisfaction levels. In addition, there has not been one major complication reported in literature for a total of more than four thousand HAL patients to date.²³ However, in order to draw a more definite and scientifically-based conclusion about the outcome of RAR as compared to other high-grade hemorrhoid treatment options, a control group treated with conventional hemorrhoidectomy would be required. Such a study may be best carried out in a university environment. A randomized study incorporating a control group is not appropriate in our hospital because of the several clear benefits offered to patients by the RAR procedure.

REFERENCES

- Morinaga K, Hasuda K, Ikeda T. A novel therapy for internal hemorrhoids: ligation of the hemorrhoidal artery with a newly devised instrument (Moricorn) in conjunction with a Doppler flowmeter. *Am J Gastroenterol* 1995; 90: 610-3.
- Longo A. Treatment of haemorrhoidal disease by reduction of mucosa and hemorrhoidal prolapse with a circular stapling device: a new procedure. *Proceedings of 6th World Congress of Endoscopic Surgery, Rome, June 3 to 6, 1998. Bologna: Ed. Monduzzi Editore, 1998: 777-84.*
- Jayaraman S, Colquhoun PH, Malthaner R. Stapled versus conventional surgery for hemorrhoids. *Cochrane Database of Systematic Reviews* 2006; 4. Art. No.: CD005393
- Pescatori M, Aigner F. Stapled transanal rectal mucosectomy ten years after. *Tech Coloproctol* 2007; 11: 1-6.
- Pescatori M, Gagliardi G. Postoperative complications after procedure for prolapsed hemorrhoids (PPH) and stapled transanal rectal resection (STARR) procedures. *Tech Coloproctol* 2008; 12: 7-19.
- Cirocco WC. Life threatening sepsis and mortality following stapled hemorrhoidopexy. *Surgery* 2008; 143: 824.
- Scheyer M, Antonietti E, Rollinger G, Mall H, Arnold S. Doppler-guided hemorrhoidal artery ligation. *Am J Surg* 2006; 191: 89-93.
- Faucheron JL, Gangner Y. Doppler-Guided Hemorrhoidal Artery Ligation for the Treatment of Symptomatic Hemorrhoids: Early and Three-Year Follow-up Results in 100 Consecutive Patients. *Dis Colon Rectum* 2008; 25.
- Wilkerson PM, Strbac M, Reece-Smith H, Middleton SB. Doppler-guided hemorrhoidal artery ligation: long-term outcome and patient satisfaction. *Colorectal Dis* 2008, 394-400.
- Meintjes D. Doppler guided hemorrhoidal artery ligation (HAL) for the treatment of hemorrhoids. Results in 1415 patients. *Patients studies 2000. Available at www.pharma.it/eng/pati.htm*

11. Bursics A, Morvay K, Kupcsulik P, Flautner L. Comparison of early and 1-year follow-up results of conventional hemorrhoidectomy and hemorrhoid artery ligation: a randomized study. *Int J Colorectal Dis* 2004; 19: 176-80.
12. Greenberg R, Karin E, Avital S, Skornick Y, Werbin N. First 100 cases with Doppler-guided hemorrhoidal artery ligation. *Dis Colon Rectum* 2006; 49: 485-489.
13. Wallis de Vries BM, van der Beek ES, de Wijkerslooth LR, van der Zwet WC, van der Hoeven JA, Eeftinck Schattenkerk M, Eddes EH. Treatment of grade 2 and 3 hemorrhoids with Doppler-guided hemorrhoidal artery ligation. *Dig Surg* 2007; 24: 436-40.
14. Arnold S, Antonietti E, Rollinger G, Scheyer M. Doppler ultrasound assisted hemorrhoid artery ligation. A new therapy in symptomatic hemorrhoids. *Chirurg* 2002; 73: 269-73.
15. Dorn HU, Mory M. 5 Years of HAL: Experience and Long-Term Results. A Prospective Study (5 Jahre HAL: Erfahrungen und Langzeitergebnisse. Eine prospektive Studie) *Coloproctology* 2007; 29: 205-10.
16. Aigner F, Bodner G, Gruber H, Conrad F, Fritsch H, Margreiter R, Bonatti H. The vascular nature of hemorrhoids. *J Gastrointest Surg* 2006; 10: 1044-50.
17. Schuurman JP, Go PMNYH, Bleys RLAW. Anatomical branches of the superior rectal artery in the distal rectum. *Colorectal Dis* 2008 (Accepted Article).
18. Hussein AM. Ligation-anopexy for treatment of advanced hemorrhoidal disease. *Dis Colon Rectum* 2001; 44: 1887-90.
19. Walega P, Scheyer M, Kenig J, Herman RM, Arnold S, Nowak M, Cegielný T. Two-center experience in the treatment of hemorrhoidal disease using Doppler-guided hemorrhoidal artery ligation: functional results after 1-year follow-up. *Surg Endosc* 2008; 22: 2379-2383.
20. Sohn N, Aronoff JS, Cohen FS, Weinstein MA. Transanal hemorrhoidal dearterialization is an alternative to operative hemorrhoidectomy. *Am J Surg* 2001; 182: 515-9.
21. Zagryadskiy EA, Gorelv SI. Transanal Doppler-guided hemorrhoidal artery ligation / recto anal repair (HAL-RAR) for treatment of Grade 3-4 hemorrhoids: a new mini-invasive technology. *Pelviperrineology* 2008; 27: 151-155.
22. Aigner F, Bodner G, Conrad F, Mbaka G, Kreczy A, Fritsch H. The superior rectal artery and its branching pattern with regard to its clinical influence on ligation techniques for internal hemorrhoids. *Am J Surg* 2004; 187: 102-8.
23. Theodoropoulos GE, Sevrisianos N, Papaconstantinou J, Panoussopoulos SG, Dardamanis D, Stamopoulos P, Bramis K, Spiliotis J, Datsis A, Leandros E. Doppler-Guided Hemorrhoidal Artery Ligation (DGHAL), Rectoanal Repair (RAR), Sutured Hemorrhoidopexy (SHP) and minimal mucocutaneous excision (MMCE) for grade III-IV hemorrhoids: a multicenter prospective study of safety and efficacy. *Colorectal Dis* 2008; 14. [Epub ahead of print]
24. Dal Monte PP, Tagariello C, Sarago M, Giordano P, Shafi A, Cudazzo E, Franzini M. Transanal hemorrhoidal dearterialisation: nonexcisional surgery for the treatment of hemorrhoidal disease. *Tech Coloproctol* 2007; 11: 333-8.
25. Cantero R, Balibrea JM, Ferrigni C, Sanz M, García Pérez JC, Pérez R, Luffiego A, Forero RG, Balibrea JL. Doppler-guided transanal hemorrhoidal dearterialisation. An alternative treatment for hemorrhoids. *Cir Esp* 2008; 83: 252-5
26. Shalaby, R, Desoky, A. Randomised clinical trial of stapled versus Milligan-Morgan hemorrhoidectomy. *Br J Surg* 2001; 88: 1049-53.

Correspondence to:

Dr. ULRIKE SATZINGER
St. Josef Krankenhaus - Auhofstraße, 189
1130 Wien - +43 (1) 878 44-0

Neural stem cell transplantation in the enteric nervous system: roadmaps and roadblocks. Schäfer KH, Micci MA, Pasricha PJ *Neurogastroenterol Motil.* 2009;21:103 This review summarizes the current status of neural stem cell (NSC) research and delineates a roadmap for effective therapeutic strategies using NSC transplantation. The ENS is vulnerable to genetic, metabolic or environmental threats, resulting in clinical disorders difficult to treat. There is much enthusiasm for novel therapies to restore ENS function in diseased segments of the gut.

Effect of age on the enteric nervous system of the human colon. Bernard CE, Gibbons SJ, Gomez-Pinilla PJ et al. *Neurogastroenterol Motil.* 2009 Feb 6. [Epub]. The effect of age on the anatomy and function of the human colon is incompletely understood. The prevalence of disorders in adults such as constipation increase with age but it is unclear if this is due to confounding factors or age-related structural defects. The number of neurons in the human colon declines with age with sparing of neuronal nitric oxide synthase positive neurons. This change was not accompanied by changes in total volume of neuronal structures suggesting compensatory changes in the remaining neurons.

Estrogen replacement avoids the decrease of bladder innervations in ovariectomized adult virgin rats: in vivo stereological study. de Fraga R, Palma P, Dambros M et al. *Int Urogynecol J Pelvic Floor Dysfunct.* 2009 Feb 17. [Epub] The authors quantified the nerve fibers in the bladder wall of ovariectomized rats with and without estradiol replacement. Long-term estrogen deprivation caused significant changes in bladder innervations, which can be characterized by a significantly decreased number of nerve fibers by 65%.

Cost-effectiveness of hormone replacement therapy for menopausal symptoms in the UK. Lekander I, Borgström F, Ström O et al. *Menopause Int.* 2009;15:19. The cost-effectiveness of five-year treatment of hormone replacement therapy (HRT) was compared with no treatment for women with menopausal symptoms. As clinical effects were considered: hip fracture, vertebral fracture, wrist fracture, breast cancer, colorectal cancer, coronary heart disease, stroke and venous thromboembolic events. An intervention was modelled by its impact on the disease risks during and after stopping treatment. The results indicated that it was cost-effective, the severity of menopausal symptoms being the single most important determinant of cost-effectiveness even where symptoms were mild.

3 – DIAGNOSTICS

Assessment of the performance of the American Urological Association symptom score in 2 distinct patient populations. Johnson TV, Schoenberg ED, Abbasi A et al. *J Urol.* 2009;181:230. Patients with low education regardless of location are more likely to misunderstand the AUA Symptom Score, a key tool in the benign prostatic hyperplasia guidelines, so they misrepresent their symptoms and may receive inappropriate treatment.

POP-Q, dynamic MR imaging, and perineal ultrasonography: do they agree in the quantification of female pelvic organ prolapse? Broekhuis SR, Kluivers KB, Hendriks JC et al. *Int Urogynecol J Pelvic Floor Dysfunct.* 2009 Feb 17. [Epub]. This study evaluates the agreement in prolapse staging between clinical examination, dynamic magnetic resonance (MR), imaging and perineal ultrasonography. Correlations were good to moderate in the anterior compartment and moderate to poor in the central and posterior compartment (Spearman's rank correlation coefficient and Bland and Altman plots).

The PFD continues on page 44

Cure of childhood urgency incontinence with a midurethral sling

PETER PETROS

Perth Hospital, Perth, Western Australia

CASE REPORT

Miss "X", a 21 year old nullipara had a major incontinence problem, since childhood which had failed to respond to any treatment including a "bladder stretch" at 8 years of age. Her main complaint was history of severe incontinence, wetting with urgency, with use of 3-4 menstrual pads per day. Urinary 24 hour diary confirmed this was a severe problem: 11 entries of urgency with micurition, with 5 recorded episodes of involuntary wetting. She also gave a history of stress incontinence, nocturia $\times 1$ per night. She was objectively assessed with a self-administered questionnaire, diary, pad tests, urodynamics, ultrasound, and "simulated operation". There was no urine loss with 10 coughs in the upright position with a bladder volume of 155 ml. 24 hour pad loss was 90.4 gm. Rotation and a bladder base descent of 17.7 mm was measured on straining during transperineal ultrasound. There was no funnelling or urine loss even with repeated coughing or straining. Overactive bladder was diagnosed on urodynamics testing. Residual urine (catheter) was 2 ml. A "simulated operation", was performed to test the diagnosis of congenital pubourethral ligament defect: the patient was examined with a bladder sufficiently full to provoke urgency in the supine position. Unilateral digital pressure at midurethra relieved the sensation of urgency 100%.¹

Risks and benefits were explained to the patient and her mother in detail. A midurethral "tension-free" polypropylene tape was inserted. Immediately after surgery, the patient reported 100% disappearance of her urge incontinence symptoms, and also, her stress incontinence symptoms. On post-operative ultrasound, bladder base descent was 9.2 cm, with no rotation. The patient remained cured at last review 4 years later.

DISCUSSION

This case is of interest on several counts. The patient had a congenital defect, confirmation of a lax pubourethral ligament with a 'simulated operation' (disappearance of urgency with digital midurethral anchoring), surgical cure in the presence of "overactive bladder", and decision to operate in a patient who intended to become pregnant sometime in the future.

The patient was assessed according to the Integral Theory System¹ which states that stress and urgency are mainly caused by ligamentous laxity, a results of damaged collagen/elastin, and this may be congenital.

The diagnosis of congenital pubourethral ligament (PUL) laxity was confirmed with transperineal ultrasound, and by a "simulated operation":¹ disappearance of urge symptoms on reinforcing the site of PUL insertion. Total cure of urgency and stress symptoms appear to validate lax PUL as the cause of symptoms. One significant concern for the patient, her mother (and indeed the surgeon), was to assess whether the proposed surgery would interfere with any future childbearing. Based on the anatomical knowledge of where the tape was placed, what happens to bladder base during labour (it rotates suprapubically), and previous experience,^{2,4} I was able to reassure the patient and her mother that problems during pregnancy or labour were unlikely. Surgical cure in the presence of urodynamic "overactive bladder"(OAB) presents a singular validation of the recent Cochrane report,⁵ that the urodynamics OAB has no predictive value in incontinence surgery.

REFERENCES

1. Petros PE. The Female Pelvic Floor. Springer Heidelberg, 2nd edition, Chapter 3, 2006; 51-82.
2. Petros PE & Ulmsten U. Pregnancy effects on the intravaginal sling operation. *Acta Obstetrica et Gynecologica Scandinavica* 1990; 69 (Suppl. 153): 77-78.
3. Tsia-Shu Lo, Huei-Jean Huang, Ling-Hong Tseng. Success of Tension-Free Vaginal Tape. Procedure After Pregnancy and Vaginal Delivery. *Journal of Gynecologic Surgery* 2001; 17: 129-131.
4. Vella M, Robinson D, Brown R, Cardozo L. 2007, Pregnancy and delivery following tension-free vaginal tape. *Int Urogynecol J Pelvic Floor Dysfunct* 2007; 18: 347-8.
5. Glazener CMA, Lapidan MC. Urodynamic investigations for the management of urinary incontinence in children and adults (Cochrane Review). In: *The Cochrane Library*, 2006; Issue 1.

Correspondence to:

Professor PETER PETROS
14A Osborne Pde
Claremont WA 6010 Australia
Phone: 61 8 9384 8064
Fax 61 8 9384 0176
Email: kvinno@highway1.com.au

Can transvaginal sonography predict infiltration depth in patients with deep infiltrating endometriosis of the rectum? Hudelist G, Tuttlies F, Rauter G et al. *Hum Reprod.* 2009;24:1012. Deep infiltrating endometriosis of the rectum often benefits from surgical treatment, including disc or segmental bowel resection, in terms of pain relief and treatment of infertility. Transvaginal sonography is a highly valuable tool in detecting rectal endometriosis preoperatively. Serosal/smooth muscle endometriotic infiltration can be accurately predicted, whereas transvaginal sonography is less valuable for detection of submucosal/mucosal involvement.

Colonoscopy: Art or science? Roberts-Thomson IC, Teo E. *J Gastroenterol Hepatol.* 2009;24:180. There has been an exponential increase in the use of colonoscopy as it facilitates the diagnosis and treatment of colonic disease, but there are public health issues that include access, training, diagnostic accuracy, complications and additions to health-care costs. Because of this, colonoscopists have a responsibility to ensure that the procedure is appropriate, safe and of high-quality. This article addresses the issue of variation in technical skills that is known to exist within the endoscopic community.

Nocturia: a non-specific but important symptom of urological disease. Schneider T, de la Rosette JJ, Michel MC. *Int J Urol.* 2009;16:249. Nocturia is a prevalent symptom with a major impact on patients' lives and a complex pathophysiology. It can be due to a range of urological conditions and non-urological diseases, an insufficient bladder capacity and/or (nocturnal) polyuria. Some of the possibly underlying non-urological diseases can be life-threatening, implying treatment priorities. Urological treatment options include alpha-adrenoceptor antagonists, muscarinic receptor antagonists and vasopressin receptor agonists.

Computer-based endoscopic image-processing technology for endourology and laparoscopic surgery. Igarashi T, Suzuki H, Naya Y. *Int J Urol.* 2009;16:533. Computer-based processing of endoscopic images will establish new tools for endourology and laparoscopic surgery in the near future. The panoramic and three-dimensional images created by computer processing are two outstanding features that can address the shortcomings of conventional endoscopy and laparoscopy, such as narrow field of view, lack of depth cue and discontinuous information. The wide panoramic images show an anatomical 'map' of the abdominal cavity and hollow organs with high brightness and resolution, as the images are taken in a close-up manner.

4 – PROLAPSES

Effect of weight change on natural history of pelvic organ prolapse. Kudish B, Iglesia C, Sokol R et al. *Obstet Gynecol.* 2009;113:81. Being overweight or obese is associated with progression of POP, and weight loss does not bring to a regression of prolapse, suggesting that damage to the pelvic floor related to weight gain might be irreversible.

Role of age, bowel function and parity on anorectocele pathogenesis according to cinedefecography and anal manometry evaluation. Soares FA, Regadas FS, Murad-Regadas SM et al. *Colorectal Dis.* 2008 Dec 22. [Epub]. Anorectocele is not correlated with parity, age, episiotomy, delivery of a large baby and anismus. It is more frequent in patients with severe constipation and less common in patients with anal hypotonia.

Multiple perineal abscesses and sinus tracts as a complication of vaginal mesh. Lewicky-Gaup C, McGuire EJ, Fenner DE. *Int Urogynecol J Pelvic Floor Dysfunct.* 2009 Feb 20. [Epub]. After anterior and posterior placement of a synthetic mesh and mid-urethral sling 3 months earlier, a 54-year-old woman was found to have two vaginocutaneous sinus tracts (to the left ischioanal fossa and to the left labia majora), as well as bilateral abscess cavities within the ischioanal fossae. The posterior mesh was completely excised, the tracts were opened and the wound was packed and allowed to heal by secondary intention.

Surgery for internal rectal prolapse: a word of caution. Pescatori M. *Colorectal Dis.* 2009 Feb 7. [Epub]

Vascular considerations for stapled haemorrhoidopexy. Aigner F, Bonatti H, Peer S et al. *Colorectal Dis.* 2009 Feb 13. [Epub]. Stapled haemorrhoidopexy does not reduce arterial inflow in the feeding vessels of the anorectal vascular plexus. Preoperative ultrasound may serve as a tool for assessing vascularization status in haemorrhoidal disease and is useful in deciding whether patients should undergo PPH or, for individuals with high arterial flow velocity, conventional haemorrhoidectomy might be a better choice.

Clinical, physiological and radiological assessment of rectovaginal septum reinforcement with mesh for complex rectocele. Zbar AP, Ansari A. *Br J Surg.* 2009;96:322.

5 – RETENTIONS

Clinical presentation and patterns of slow transit constipation do not predict coexistent upper gut dysmotility. Zarate N, Knowles CH, Yazaki E et al. *Dig Dis Sci.* 2009;54:122. Slow transit constipation is associated with upper gastrointestinal tract motor abnormalities in a subset of patients and this could influence the clinical approach, particularly in those rare cases where surgical management is considered. However while upper tract dysmotility is frequent, prediction on the basis of clinical history and characteristics of colonic transit remains problematic.

Apoptotic cell death of human interstitial cells of Cajal. Gibbons SJ, De Giorgio R, Pellegrini MS et al. *Neurogastroenterol Motil.* 2009;21:85. Apoptotic cell death is a continuing process in interstitial cells of Cajal, specialized mesenchyme-derived cells that regulate contractility and excitability of many smooth muscles. The level of apoptosis in healthy colon indicates that these cells must be continually regenerated to maintain intact networks. Their loss is seen in a variety of gut motility disorders.

Oral mucosal grafts urethroplasty for the treatment of long segmented anterior urethral strictures. Xu YM, Sa YL, Fu Q et al. *World J Urol.* 2009 Feb 13. [Epub] Combined two oral mucosal grafts substitution urethroplasty is an effective technique for the treatment of long, segmented urethral strictures (25 cases between 2002 and 2008).

Primary genitourinary melanoma presenting as voiding dysfunction. Filipkowski LA, Barker MA, Karram MM. *Int Urogynecol J Pelvic Floor Dysfunct.* 2009 Feb 12. [Epub]. A cystourethroscopy performed during a workup for pelvic organ prolapse revealed a bladder and urethral mass initially interpreted as undifferentiated sarcoma, and as malignant melanoma after immunohistochemical staining.

The association between regional anesthesia and acute postoperative urinary retention in women undergoing outpatient midurethral sling procedures. Wohlrab KJ, Erekson EA, Korbly NB et al. *Am J Obstet Gynecol.* 2009;200:571.e1. Regional anesthesia (spinal or combined spinal/epidural) is a risk factor for acute postoperative urinary retention following outpatient midurethral slings.

What happens to children with idiopathic constipation who receive an antegrade continent enema? An actuarial analysis of 80 consecutive cases. Jaffray B. *J Pediatr Surg.* 2009;44:404. A prospective analysis of the outcomes of 80 children with idiopathic constipation whose symptoms failed to resolve with medical management and who underwent construction of an antegrade continent enema (ACE), revealed that children have 0.2 probability of cure, 0.3 probability of failure, and 0.5 probability of having to continue with ACE after 6 years of treatment.

The PFD continues on page 50

Retropubic urethrolysis and tape sectioning for obstruction following incontinence surgery. Long-term results

JESÚS ROMERO MAROTO (*) - MANUEL ORTIZ GORRAIZ (*) - JUAN J. MIRALLES BUENO (**)
LUIS GÓMEZ PÉREZ (*) - JUAN J. PACHECO BRU (*) - CRISTÓBAL LÓPEZ LÓPEZ (*)

(*) Department of Urology, San Juan de Alicante University Hospital, Alicante, Spain

(**) Department of Public Health, Miguel Hernandez University, San Juan de Alicante University Hospital, Alicante, Spain

Abstract: To evaluate the long terms results of retropubic urethrolysis and TVT tape section. Twenty-three patients were treated for clinical-urodynamic urinary obstruction following incontinence surgery between 1996 and 2004. Nineteen patients could be located and they completed a clinical review. Nine patients (Group I) underwent a retropubic urethrolysis procedure. In ten patients (Group II) section of the TVT sling was performed. Mean follow up was 59 ± 25 months in the urethrolysis group I ($n = 9$) and 39 ± 18 months in the TVT tape section group II ($n = 10$). All patients were reviewed by clinical interview, urine flowmetry, residual volume and cough test. Subjective assessment was carried out by questionnaires: SUIQ, I-QOL and PGI-I. Maximum average flow was significantly enhanced in both groups – to a greater extent in the TVT-section group. Residual volume disappeared in all cases. According to medical history, urgency was completely abolished in 12% of cases with relief in 87% in group I. In group II, urgency was totally eliminated in 66% with improvements seen in 33%. No patients, according to SUIQ questionnaire, were cured of their urgency incontinence in group I and only 50% in group II. I-QOL questionnaire showed 33% of patients in group I with more than 80 points and 50% in group II. The PGI-I questionnaire showed that 22% of patients in group I and 40% in group II experienced great improvement, and 33% in group I and 30% in group II showed sufficient improvement. Urethrolysis and tape sectioning can be highly successful to relieve iatrogenic obstruction and seem to be long-lasting. Complete resolution of storage symptoms is less likely. Quality of life evaluation of the outcome of urethrolysis and tape section is necessary.

Key words: Iatrogenic obstruction; Stress urinary incontinence; Tape sectioning; Urethrolysis.

INTRODUCTION

Standard surgery for urinary incontinence can cause urinary dysfunction along with storage or voiding symptoms, or both simultaneously, in 2-24% of cases.¹

Tension-free vaginal tape (TVT), introduced by Ulmsten in 1995,² has not eliminated these complications. In addition, the procedure occasionally causes further urinary dysfunction with similar characteristics occurring in up to 26% of cases³ and necessitating tape sectioning in 4-6% of cases.^{4,5} Although there are less data on surgical outcome with the transobturator tape technique, complications do not seem to be eliminated completely with this technique either.^{6,7}

Satisfactory results have been published for both urethrolysis and the sectioning of suburethral tape.⁴ However, there is a clear lack of long-term results, above all those obtained via quality of life questionnaires.⁸

The objective of this study is to evaluate the long-term results in patients who underwent two types of urethrolysis: retropubic urethrolysis and section of TVT tape. Furthermore, we aim to examine the factors that could influence the results.

MATERIALS AND METHODS

Twenty-three patients were treated for urinary obstruction following incontinence surgery in our department from 1998 to 2006. Nineteen of these patients could be located and they agreed to undergo a clinical review.

Conventional surgery for incontinence had been carried out in nine cases: Burch in six, Raz in two and Marshall-Marchetti-Krantz in one. These cases constitute group I. TVT was conducted in ten cases, making up group II.

The diagnosis of obstruction was based on a combination of the following: a clear relationship between surgery and the development of symptoms, urodynamics parameters (relatively high detrusor pressure, low maximum flow rate and residual volume), physical examination and endoscopic parameters (urethral angulation or kinking). The onset of symptoms was immediate in all patients in both groups following surgery. Table 1 outlines patients' clinical characteristics and urodynamics parameters prior to incontinence

surgery. It also shows the clinical status obtained by questions in the history and the complementary findings following incontinence surgery.

In group I, urethrolysis was carried out retropubically. The urethra was mobilized with scissors and a blunt dissection, releasing all adhesions to the pubic symphysis. Sufficient and easy mobility was determined when the bladder-neck and urethra were completely free from adhesions. Urethrolysis in group II involved locating and sectioning one of the two branches of the sling. For this, it is often necessary to dissect widely the lateral side to locate the tape.

Urethrolysis was carried out between 7 and 95 months (37.3 ± 29.2) following incontinence surgery in group I and between 3 and 36 months post-surgery (18.5 ± 12.4) in group II. Follow-up periods ranged from between 25 to 84 months (59.3 ± 25.2) for the first group and 15 to 70 months (39.1 ± 18.8) for the second group.

All patients had been reviewed by clinical interview six months after urethrolysis or tape section. Free flowmetry and residual volume measurement had also been performed.

Initially, in the current review, an analysis of the medical condition through a medical interview was carried out, taking into consideration the persistence, improvement or disappearance of storage and voiding symptoms and the presence of stress and urge incontinence.

Patients were then asked to complete three different validated questionnaires:⁹⁻¹⁰

1. - Degree and type of incontinence (SUIQ).
2. - Incontinence Quality of Life (I-QoL).
3. - Patient Global Impression of Improvement (PGI-I).

Following this, an objective appraisal was carried out: stress incontinence was evaluated with a full bladder in supine and standing positions. Patients were asked to cough and to perform a Valsalva maneuver. Free flowmetry and echographic measurement of residual urine volume were then performed.

The clinical variables obtained following incontinence surgery were compared with those obtained six months post-urethrolysis or tape section. These were compared with the clinical variables collated in the current revision.

TABLE 1. – Clinical characteristics and urodynamic parameters previously and later SUI surgery.

Parameter	Previously SUI surgery		Later SUI surgery	
	Group I	Group II	Group I	Group II
Urgency (n, %)	4 (44%)	4 (40%)	8 (88%)	9 (90%)
Urge urinary incontinence (n, %)	2 (22%)	3 (30%)	7 (77%)	8 (80%)
Daytime frequency of urination (h)†	2±1.4	1.8±0.7	1.5±1.3	1.8±1
Hesitancy (n, %)	0	0	4 (44%)	7 (70%)
Straining (n, %)	0	0	7 (77%)	9 (90%)
Frank retention (n, %)	0	0	1 (11%)	1 (10%)
Urethral overcorrection on physical exam (n, %)	0	0	9 (100%)	9 (90%)
Urethral angulation on cystoscopy (n, %)	0	0	9 (100%)	10 (100%)
Stress incontinence on physical exam (n, %)	9 (100%)	10 (100%)	0	0
Q _{max} (ml/s)†	20.3±7.5	18±6.2	11.5±5.3	9.5±3.6
V _u (ml)†	289.6±77.6	341.3±91.7	175.8±58.5	202.7±88.7
V _r over 100 ml (n, %)	0	0	3 (33%)	7 (70%)
P _{det} Q _{max} (cmH ₂ O)†	–	–	44.7±4.3	38.3±18.1

Q_{max}: maximum flow rate; V_u: voided volume; V_r: residual volume; P_{det}Q_{max}: detrusor pressure at maximum flow; † Median ± SD; Group I: conventional surgery (n =9); Group II: tension-free vaginal tape (n = 10).

The relationship between the variables including age, the surgical technique for incontinence, post-urethrolysis urgency, stress incontinence and maximum flow rate post-urethrolysis with I-QOL quality of life questionnaire were assessed.

Descriptive statistical analysis of the study was conducted using the data processing package SPSS 12.0. Quantitative and qualitative variables were analyzed via the statistical Student-t and Chi-Square tests, respectively, and a value of P < 0.05 was considered as statistically significant. Comparability between the medical history and the administered questionnaires was evaluated using the kappa test. Finally, univariate analyses were performed using the Spearman correlation coefficient to determine potential associations between the different variables derived from the I-QOL questionnaire. Multivariate logistic regression was not carried out due to the number of independent variables analyzed, a larger sample size would be necessary to obtain significant results.

RESULTS

Table 2 illustrates symptomatology, as collected from the medical chart and objective parameters of both groups six months and at the current visit after urethrolysis or tape sectioning.

A clear clinical improvement is evident with regards to the eradication or improvement of both storage and voiding symptoms six months after urethrolysis and tape sectioning. Significant differences were also evident for maximum flow after urethrolysis (p = 0.035) and after tape sectioning (p = 0.014). Residual volume also disappeared in all patients presenting it previously. Stress incontinence appeared in four patients, one in group I and three in group II.

The clinical improvement obtained at six months was maintained at the current visit, and there was no significant difference in maximum flow rate in the urethrolysis group (p = 0.136) nor in the tape section group (p = 0.870). The absence of residual volume was equally maintained.

Table 3 presents the results obtained from the SUIQ questionnaire, determining the presence of continence or incontinence (urge or stress). Incontinence was classified as fewer

TABLE 2. – Clinical characteristics and urodynamic parameters later urethrolysis and tape section.

Parameter	Six months postoperative visit		Current postoperative visit		value of P ‡
	Group I	Group II	Group I	Group II	
Eradication of urgency (n, %)	1 (12%)	6 (66%)	0	7 (77%)	0.001
Improved urgency (n, %)	7 (87%)	3 (33%)	7 (87%)	2 (22%)	–
Persistent urge urinary incontinence (n, %)	5 (71%)	3 (37%)	6 (75%)	2 (25%)	0.001
Daytime frequency of urination (h)†	2±0.7	2.8±0.4	2.3±0.8	3.2±0.6	0.038
Eradication of hesitancy (n, %)	4 (100%)	6 (85%)	4 (100%)	6 (85%)	n.s.
Eradication of straining (n, %)	6 (85%)	7 (77%)	6 (85%)	8 (88%)	n.s.
Frank retention (n, %)	0	0	0	0	n.s.
Stress incontinence on physical exam (n, %)	1 (11%)	3 (30%)	1 (11%)	3 (30%)	n.s.
Q _{max} (ml/s)†	12.4±7.8	21±9.3	15±6.1	20.2±9.3	0.014
V _u (ml)†	219.5±93.5	216.3±85.8	234.5±99.6	194.5±94.6	n.s.
V _r over 100 ml (n, %)	0	0	0	0	n.s.

Q_{max}: maximum flow rate; V_u: voided volume; V_r: residual volume; † Median ± SD; ‡ Comparison of both groups at current postoperative visit; Group I: conventional surgery (n =9); Group II: tension-free vaginal tape (n = 10).

TABLE 3. – Postoperative questionnaires results.

Questionnaire	Score / Scale	Group I (n, %)	Group II (n, %)
SUIQ	Stress urinary incontinence (weekly episodes)		
	0	8 (88%)	7 (70%)
	< 5	0	0
	5-15	1 (11%)	2 (20%)
	>15	0	1 (10%)
Urge urinary incontinence (weekly episodes)	0	0	5 (50%)
	< 5	6 (66%)	1 (10%)
	5-15	1 (11%)	4 (40%)
	>15	2 (22%)	0
	I-QOL	86-100	3 (33%)
71-85		1 (11%)	3 (30%)
56-70		0	1 (10%)
0-55		5 (55%)	1 (10%)
PGI-I	Greatly improved	2 (22%)	4 (40%)
	Sufficiently improved	3 (33%)	3 (30%)
	Slightly improved	3 (33%)	3 (30%)
	Unchanged	1 (11%)	0
	Worse	0	0

SUIQ: Stress and Urge Incontinence Questionnaire; I-QOL: Incontinence Quality of Life Questionnaire; PGI-I: Patient Global Impression of Improvement.

than 5, between 5 and 15 and more than 15 episodes per week. It also presents the results from the other questionnaires: I-QOL: maximum score was 100 points, representing the best result. Answers were classified arbitrarily into four groups: from 100 to 86, from 85 to 71, from 70 to 56 and less than 55. PGI-I: answers are classified as greatly improved, sufficiently improved, slightly improved or unchanged. No patient reported worsening of their condition following intervention.

There was a high level of agreement between the results obtained from the medical histories and the results of the SUIQ questionnaire concerning stress urinary incontinence (κ 1). The level of agreement was lower when urge urinary incontinence was taken into account (κ 0.503).

Univariate analysis indicated a negative correlation between the presence of postoperative urgency and I-QoL scores (Spearman Rho Coef. 0.399; $p = 0.045$), with further evidence for a correlation, although positive, between the postsurgical maximum flow rate and I-QOL scores (Spearman Rho Coef. 0.508; $p = 0.016$).

DISCUSSION

Surgery for stress incontinence, whether it involves standard techniques or tension-free vaginal tape (TVT), causes obstructive voiding dysfunction in a varying proportion of cases.^{1,3-5} A minor obstruction, causing minimal or no symptomatology, is possibly evoked with even greater frequency. A significant decrease in maximum flow rate following the implantation of TVT has been described, at below 12 ml/s one year after surgery in 34.5% of cases.³ Why urination is compensated, and rarely symptomatic, in some cases and in others leaves the patient with irritation and/or considerable residual volume is unknown. It possibly depends, at least in part, on the balance between the degree of obstruction and the contractile capacity of the detrusor. The long-term consequences of subclinical obstruction are not known.¹¹

The diagnosis of urinary obstruction in women is difficult, and no universally accepted urodynamic criteria exist. When it appears following incontinence surgery, the diag-

nosis is fundamentally based on a clear correlation with the surgical antecedent and the timing of symptom manifestation.¹² Furthermore, urodynamics alone is unreliable for predicting the outcome of urethrolysis.¹³⁻¹⁵ In accordance with this, our study did not use urodynamic criteria alone. In all patients, voiding or storage symptoms occurred immediately after surgery. The diagnosis was also supported by a clear reduction of maximum flow rate, the presence of residual volume, in some cases by a relatively increased detrusor pressure, and by urethral angulation.

Maximum average flow following urethrolysis or tape sectioning was significantly increased and residual urine eliminated in all cases six months after surgery. This confirms the presence and subsequent healing or improvement of an obstruction. However, maximum flow rate was increased more in cases of tape section than in cases of urethrolysis. It therefore seems that tape section, in our cases at least, is better at relieving obstruction than urethrolysis.

Voiding symptoms disappeared in all but three cases of every group, which are very difficult to explain as the maximum flow rate in these patients changed from 9.5 (6-13) to 17 (10-25) and the residue was eliminated in all cases.

In patients receiving standard surgery, according to the medical history, urgency was completely abolished in 12% (1/8) of cases with relief evident in 87% (7/8). In the suburethral tape group, urgency was totally eliminated in 66% (6/9) with improvements seen in 33% (3/9). Similar results can be found in the literature, according to the evaluation of clinical history. Cross et al. reported an 85% relief of urge incontinence upon conventional urethrolysis.¹⁶ Long et al., on the other hand, achieved complete symptom relief in 86% of their patients and an improvement in the remainder by performing a lateral sectioning of the TVT.¹⁷

The persistence of urgency can be attributed to persistence of obstruction, either due to insufficient release, or new adhesions in the case of retropubic urethrolysis. Scarpero et al., however, observed, in 23 second urethrolysis the abolition of obstructive symptoms in 92% and a complete interruption of urgency in only 12%. Covering the retropubic space with the omentum did not affect the results.⁸ In our study, the complete eradication of residual volume, a considerable increase in maximum flow rate, and the non-variation of voiding symptoms over the years make this an improbable diagnosis. The persistence of urgency possibly depends, not only on obstruction, but also on damage to small nerve branches or urethral inflammation caused by the tape in the case of TVT.¹⁸ Potential damage to small pelvic nerve branches, due to a more aggressive surgery, could explain the persistence of urge urinary incontinence in a larger percentage of patients undergoing retropubic procedures.

Leng et al. have suggested a relationship between the time until urethrolysis and persistence of symptoms after the same.¹⁸ The difference in time intervals in our cases and the reduced number of cases make it impossible to analyze this variable.

Clinical symptomatology, maximum flow rate, and the presence or absence of residual volume have remained constant over time with minimal worsening of urgency in one case in group I and improvement in another case in group II. This suggests that the effects of urethrolysis and tape sectioning are durable. However, they have been reported to subside within two years,⁸ therefore care should be taken.

The evaluation via questionnaires shows poorer results than the clinical history. The SUIQ questionnaire which defines whether incontinence exists, as well as its type and intensity, shows that 14 women continue to suffer from urge urinary incontinence, a figure much higher than 8 as

revealed by clinical history. Neither are the results accordant with those of the clinical evaluation when the impact on quality of life is examined and therefore patient satisfaction is taken into account. The I-QOL which quantifies, with a maximum of 100 points, the impact of the varying symptoms on the perception of quality of life, revealed that five of the six women who presented with improved urgency according to their medical history had a score of below 56 out of 100 points, signifying an important impact on their quality of life. It seems that medical history tends to minimize the importance of urgency for the patients.

The divergence between the clinical results interpreted by the medical and the subjective perception of the patient clearly indicate the need to include the quality of life questionnaires in the evaluation of surgical outcome. The variation in questionnaire scores before and after urethrolysis or tape section are important parameters to be taken into consideration.

Tape section has had a more positive impact on quality of life than urethrolysis; 50% of patients in group II scored above 85 in the I-QOL questionnaire and 70% felt sufficiently or greatly improved according to the PGI-I questionnaire in contrast to 33% and 55% respectively in group I. The suburethral tape appears to clearly produce obstruction when excessive tension is applied and this seems to be the fundamental cause of the presence of symptoms in this clinical group. In the clinical group of patients undergoing classic surgery it is possible that other factors related to the more aggressive techniques are also of great influence.

Persistence of urgency following surgery exhibited a slightly negative correlation with quality of life following univariate analysis. Maximum flow rate results also display a trend, in this case positive, with quality of life. In both cases, a larger sample and a multivariate study are necessary for this to be confirmed.

Stress urinary incontinence was evident in 11% of the cases in group I and in 30% in group II already at six months follow-up. Two of these have been satisfactorily treated using the TOA procedure.¹⁹ The rest of the patients had remained stress continent throughout.

The current tendency is not to carry out a new anti-incontinence procedure following urethrolysis or tape section.⁴

²⁰ We believe that it is important to solve the problem of obstruction and not to risk provoking it further.

CONCLUSIONS

Urethrolysis and tape sectioning can be highly successful to relieve iatrogenic obstruction and seems to be long-lasting. Complete resolution of storage symptoms is less likely. Quality of life questionnaires before and after surgery are necessary for a proper evaluation of the outcome of urethrolysis and tape section.

KEY OF DEFINITIONS FOR ABBREVIATIONS

I-QOL: Incontinence Quality of Life Questionnaire; $P_{det, Q_{max}}$: detrusor pressure at maximum flow; PGI-I: Patient Global Impression of Improvement; Q_{max} : maximum flow rate; SUIQ: Stress and Urge Incontinence Questionnaire; TOA Trans-obturator adjustable tape; TVT: Tension-free vaginal tape; V_r residual volume; V_u voided volume.

REFERENCES

1. Leach GE, Dmochowski RR, Appell RA, Blaivas JG, Hadley HR, Lubner KM, et al. Female urinary stress incontinence clinical guidelines. Panel summary report on surgical management of female stress urinary incontinence. *J Urol* 1997; 158: 875.
2. Ulmsten U, Petros P. Intravaginal slingplasty: An ambulatory surgical procedure under local anesthesia for treatment of

- female urinary incontinent. *Scand Journal Urol Nephrol* 1995; 29: 75.
3. Gateau T, Faramarzi-Roques R, Le Normand L, Glemain P, Buzelin JM, Ballanger P. Clinical and urodynamic repercussions after TVT procedure and how to diminish patients complaints. *Eur Urol* 2003; 44: 372.
4. Croak AJ, Schulte V, Peron S, Klingele C, Gebhart S, Lee R. Transvaginal tape lysis for urinary obstruction after tension-free vaginal tape placement. *J Urol* 2003; 169: 2238.
5. Morey AF, Medendorp AR, Noller MW, Mora RV, Shandera KC, Foley JP, et al. Transobturator versus transabdominal midurethral slings: a multiinstitutional comparison of obstructive voiding complications. *J Urol* 2006; 175: 1014.
6. deTayrac R, Deffieux X, Droupy S, Chaveaud-Lambling A, Calvanesse-Benamour L, Fernandez H. A prospective randomized trial comparing tension-free vaginal tape and transobturator suburethral tape for surgical treatment of stress urinary incontinence. *Am J Obstet Gynecol* 2005; 192: 339.
7. Deval B, Ferchaux J, Berry R, Gambino S, Ciofu C, Rafii A, et al. Objective and subjective cure rates after trans-obturator tape treatment of female stress urinary incontinence. *Eur Urol* 2006; 49: 373.
8. Scarpero HM, Dmochowski RR, Nitti V. Repeat urethrolysis after failed urethrolysis for iatrogenic obstruction. *J Urol* 2003; 169: 1013.
9. Norton PA, Zinner NR, Yalcin I, Bump RC. Duloxetine versus placebo in the treatment of stress urinary incontinence. *Am J Obstet Gynecol* 2002; 187: 40.
10. Yalcin I, Bump RC. Validation of two global impression questionnaires for incontinence. *Am J Obstet Gynecol* 2003; 180: 98.
11. Sander P, Sorensen F, Lose G. Does the tension free vaginal tape procedure (TVT) affect the voiding function over time? Pressure-flow studies 1 year and 3 years after TVT. *Neurourol Urolyn* 2007; 26: 995.
12. Carr LK, Webster GD. Obstruction following anti-incontinence procedures: diagnosis and treatment with retropubic or vaginal urethrolysis. *J Urol* 1997; 157: 821.
13. Webster GD, Kreder KJ. Voiding dysfunction following cystourethropepy: its evaluation and management. *J Urol* 1990; 144: 670.
14. Foster HE, McGuire EJ. Management of urethral obstruction with transvaginal urethrolysis. *J Urol* 1993; 150: 1448.
15. Nitti VW, Raz S. Obstruction following anti-incontinence procedures: diagnosis and treatment with transvaginal urethrolysis. *J Urol* 1994; 152: 93.
16. Cross CA, Cespedes RD, English SF, McGuire EJ. Transvaginal urethrolysis for urethral obstruction after anti-incontinence surgery. *J Urol* 1998; 159: 1199.
17. Long CY, Lo TS, Liu CM, Hsu SC, Chang Y, Tsai EM. Lateral excision of tension-free vaginal tape for the treatment of iatrogenic urethral obstruction. *Obstet Gynecol* 2004; 104: 1490.
18. Leng WW, Davies BJ, Tarin T, Sweeney DD, Chancellor MB. Delayed treatment of bladder outlet obstruction after sling surgery: Association irreversible bladder dysfunction. *J Urol* 2004; 172: 1379.
19. Romero Maroto J, Ortiz Gorraiz M, Prieto Chaparro L, Pacheco Bru JJ, Miralles Bueno JJ, Lopez Lopez C. Transvaginal adjustable tape: an adjustable mesh for surgical treatment of female stress urinary incontinence. *Int Urogynecol J Pelvic Floor Dysfunct* 2008 [Epub ahead of print].
20. Goldman HB, Rackley RR, Appell RA. The efficacy of urethrolysis without re-suspension for iatrogenic urethral obstruction. *J Urol* 1999; 161: 196.

Correspondence to:

JESÚS ROMERO MAROTO
San Juan de Alicante Hospital, Alicante
Valencia road 03550. San Juan de Alicante (Alicante) Spain
Phone and Fax number: 00 + 34 965 93 86 13
jromeroma@telefonica.net

Complex pelvic problems - a multidisciplinary perspective

MARCO SOLIGO

Servizio di Uroginecologia, U.O. Ginecologia e Ostetricia - Ospedale San Carlo Borromeo, Milano

“I think that any system, whatever it might be, is complex by its own nature” as Edgar Morin¹ states in his comments on the modern philosophical concept of “Complex Thinking”.

The Pelvic Floor (PF) as a system doesn't escape this general rule. This is true for every component – urological, gynaecological, colorectal – of the PF and moreover it is true for the whole system.

It is a common experience for clinicians dedicated to PF disorders to deal quite frequently with complex conditions whose actual understanding is extremely limited. As an example we could consider the topic of the use of prosthetic material in pelvic floor reconstructive surgery: in 2008 three literature Reviews have covered this subject^{2,4} all substantially confirming the statement of 2005 IUGA roundtable: “*With a few exceptions, the current expansion of graft utilization in pelvic reconstructive surgery is not a product of evidence-based medicine*”.

Generally speaking in many cases clinical decision making can't be based on sound scientific evidence but has to rely on unsystematic clinical experience, intuition, and hypothetical pathophysiologic rationale. Faced to the scant quality of the scientific evidence in various field of our discipline the current solution proposed by the scientific community is to improve the evidence through higher qualitative scientific instruments (i.e. randomized studies).

We are in fact in the era of Evidence Based Medicine (EBM). In 1992 the EBM working group stated that “*A New paradigm for medical practice is emerging. EBM de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision making ...*”.⁶ In other words EBM represents a more sophisticated method to investigate the nature and lies on a higher level in an hypothetical scale to assess the quality of scientific method (Fig. 1).

But we have to be stik to the fact that EBM is simply a method, grounded on statistical concepts and strictly dependent from the variables considered.

EBM is not *per se* “the Answer”.

In fact despite this extremely powerful instrument sounded

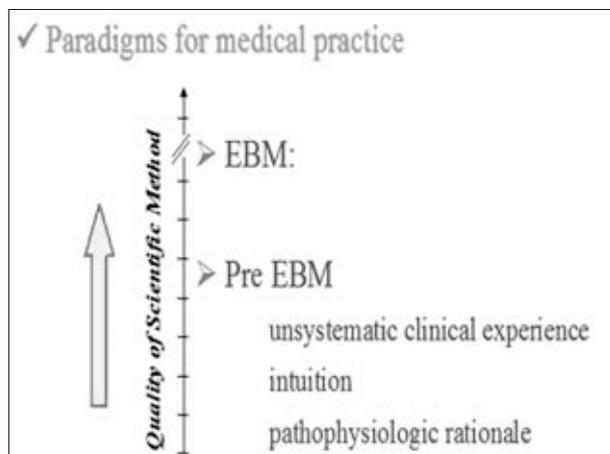


Fig. 1. – Paradigms for medical practice.

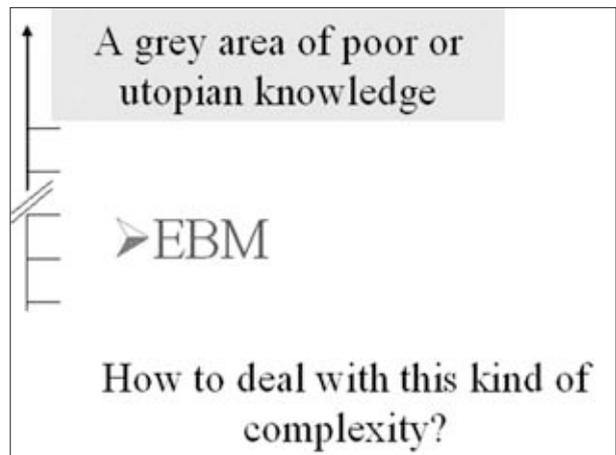


Fig. 2. – The Challenge of Complexity.

evidence is still lacking in many fields of our discipline, and scientific instruments are actually not producing the answers we are waiting for. In other words there is a *grey area* of poor or utopian knowledge that lies between the level of EBM and the “Truth”: this is the challenge of Complexity to the scientific method (Fig. 2).

The epistemology of Complexity is among the main topics of the contemporary philosophical debate and can be identified in all the scientific domains. Especially in physics this has been elucidated more than 50 years ago and traces can be found in the work of Max Born starting in the fifties of the last century.

In medicine, and coming to us, in PF disorders, this concept is apparently ignored.

Edgar Morin, now in his eighties, can be considered one of the most important authors dealing with the philosophical concept of “Complex Thinking”. In Morin's view,¹ the problematic of complexity has been rejected by classical science in virtue of three fundamental explanatory principles:

1. *The principle of universal determinism*
2. *The principle of reduction*
3. *The principle of disjunction*

In particular the last one principle «... consists in isolating and separating cognitive difficulties from one another, leading to the separation between disciplines, which have become hermetic from each other... In this scientific conception, the notion of “complexity” is absolutely rejected. On the one hand, it usually means confusion and uncertainty; the expression “it is complex” in fact expresses the difficulty of giving a definition or explanation. On the other hand, since the truth criterion of classical science is expressed by simple laws and concepts, complexity relates only to appearances that are superficial or illusory. Apparently, phenomena arise in a confused and dubious manner, but the mission of science is to search, behind those appearances, the hidden order that is the authentic reality of the universe».

Then he recognises that “... These principles led to extremely brilliant, important, and positive developments of scientific knowledge up to the point where the limits of

intelligibility which they constituted became more important than their elucidations”.

Here is the point: *where the limits of intelligibility became more important than their elucidations*. This is the grey area that we have described in figure 2 as an area of “*poor or utopian knowledge*”. An area where our actual scientific instruments are not able to give answers.

Currently we are used to think that this *grey area* will be fully covered by improved methodological efforts; is it exclusively a matter of instruments. However this is only partially truth. The limit of the knowledge will certainly move ahead, but it will be never eliminated.

Even rejecting the concept of “*limitation*”, at present, as we have already discussed, our knowledge faces important limitations; happy or not, we actually have to deal with the *grey area*. What to do? Do we need a different approach?

I am wondering whether a new paradigm would be more effective. The concept of “Complex Thinking” is extremely appealing in this view. The “Complex Thinking” paradigm, by definition would not exclude the present scientific instruments; on the contrary it would integrate them in a wider network. Again Morin retakes an expression of Vico as *Scienza Nuova*: “*It is necessary to amplify the idea of scienza nuova by introducing the interaction between the simple and the complex, by conceiving a science that does not suppress disciplines but connects them, and consequently makes them fertile, a science which can at the same time distinguish and connect and where transdisciplinarity is inseparable from complexity*”.

As a classical scientist I am wondering whether philosophical concepts could have something to do with urinary incontinence, pelvic chronic pain or evacuatory difficulties...

Nevertheless I am quite sure that opening a debate with “Complex Thinking” Philosophers could be extremely fruitful for our understanding and could also have an impact on our clinical practice.

REFERENCES

1. Morin E. Proceedings of the Colloquium “Intelligence de la complexité: épistémologie et pragmatique”, Cerisy-La-Salle, France, June 26th, 2005. Translated from French by Carlos Gershenson.
2. Jakus SM, Shapiro A, and Hall CD. Biologic and Synthetic Graft Use in Pelvic Surgery: A Review. *Obstet and Gynecol Surv* 2008; 63: 253-266.
3. De Ridder D. Should we use meshes in the management of vaginal prolapse? *Current Opinion in Urology* 2008; 18: 377-382.
4. Ridgeway B, Chen CCG, and Paraiso MFR. The use of synthetic mesh in pelvic reconstructive surgery clinical. *Obst and Gyn* 2008; 51: 136-152E.
5. Davila GW, Drutz H, Deprest J. Clinical implications of the biology of grafts: conclusions of the 2005 IUGA Grafts Roundtable. *Int Urogynecol J* 2006; 17: S51-S55.
6. JAMA.

Corresponding Author:

MARCO SOLIGO

Servizio di Uroginecologia, U.O. Ginecologia e Ostetricia
Ospedale San Carlo Borromeo, Milano

6 – INCONTINENCES

Fecal incontinence in obese women with urinary incontinence: prevalence and role of dietary fiber intake. Markland AD, Richter HE, Burgio KL. *Am J Obstet Gynecol.* 2009 Jan 9 Epub. In 336 overweight and obese women with urinary incontinence a high prevalence of monthly fecal incontinence associated with low dietary fiber intake was reported. Comparing dietary intake in women with and without incontinence, increasing dietary fiber appears to be a useful treatment.

What a patient with refractory idiopathic detrusor overactivity should know about botulinum neurotoxin type A injection. Khan S, Kessler TM, Apostolidis A et al. *J Urol.* 2009;181:1773. A total of 81 consecutive patients with refractory idiopathic detrusor overactivity treated with intradetrusor injections of 200 U botulinum neurotoxin type A at 20 sites per injection course were evaluated in this prospective, nonrandomized, open label cohort study. Their quality of life significantly improved and the positive effect was sustained after repeat injection.

Incidence and remission of urinary incontinence in a community-based population of women ≥ 50 years. Komesu YM, Rogers RG, Schrader RM, Lewis CM. *Int Urogynecol J Pelvic Floor Dysfunct.* 2009 Feb 20. [Epub]. The objective of the study was to determine incidence, remission, and predictors of change in urinary incontinence in women over 50 in a racially diverse population. Severe urinary incontinence incidence was lower but increased with age. Improvement of severe urinary incontinence decreased with age. Ethnicity and age predicted progression while age predicted improvement.

Sacral Nerve Modulation and other treatments in patients with faecal incontinence after unsuccessful pelvic floor rehabilitation: a prospective study. Koch SM, Melenhorst J, Uluda_O et al. *Colorectal Dis.* 2009 Feb 7. [Epub]. SNM is a minimally invasive technique for the treatment of faecal incontinence. This study investigates the results of SNM after negative outcome of a standardized pelvic floor rehabilitation program for the treatment of faecal incontinence. Thirty-five patients had a test stimulation and 19 patients proceeded to a SNM implant. Faecal incontinence episodes per week decreased significantly over 24.1 months follow-up. The overall success rate was 49% (17/35). The patients with unsuccessful test stimulation received other treatments.

Postanal repair - Do the long-term results justify the procedure? Mackey P, Mackey L, L Kennedy M et al. *Colorectal Dis.* 2009 Feb 7. [Epub]. In patients with neurogenic incontinence early outcomes after postanal repair (PAR) demonstrated excellent results but subsequent reports showed a declining success rate in maintaining continence. 111 patients who underwent PAR from 1986 to 2002 from 4 surgeons were identified: 54 were lost to follow-up, 3 had a stoma (2 for incontinence), 4 had undergone a graciloplasty, leaving 57 patients (F=53), mean follow-up 9.1yrs (2.2 - 18.7). Mean CCS was 11.7 (SD7.4). 26% (n = 15) scored none to minimal incontinence (CCS 0 - 5), 26% moderate (CCS 6 - 12), and 48% (n = 27) severe incontinence (CCS 13-24). 79% (n=45) were anyway satisfied with the outcome. PAR remains a useful treatment. It is associated with low morbidity and results in a satisfactory long-term subjective outcome, despite a high incontinence score.

Anatomical relationship and fixation of tension-free vaginal tape Secur. Hubka P, Masata J, Nanka O et al. *Int Urogynecol J Pelvic Floor Dysfunct.* 2009;20:681. In 14 embalmed and 5 fresh frozen female bodies TVT-S inserters were placed bilaterally. After dissection distances the mean distance of TVT-S from the obturator bundle (obturator nerve and obturator vessels) was measured, being 3.05 cm (SD 1.18 cm) on the left, 3.07 cm (SD 1.17 cm) on the right. Perforation of the fascia of obturator internus muscle occurred in 46.4%. Injury of variable vessels can occur. In conclusion there is a minimal risk of injury to the obturator bundle, but a significant risk of inserting the TVT-S inserter into the obturator fossa. The position of TVT-S does not change significantly after legs mal-positioning.

The PFD continues on page 54

Impact of urinary incontinence on quality of life

STAVROS CHARALAMBOUS - ARGYRIOS TRANTAFYLIDIS

Department of Urology, Ippokratia General Hospital - Thessaloniki, Greece

Abstract: Urinary incontinence (UI) is a relatively common condition in middle-aged and older women. Although it is not a life-threatening condition, UI negatively impacts health-related quality of life (QOL) by affecting daily living activities, sexual and interpersonal relationships, psychological well being and social interactions. Some studies also indicate that the social problems associated with UI grow with time, but it is not clear if that is a function of increasing severity of the condition, or the particular adaptations required for coping with this problem. In this article we evaluate recent scientific observations regarding the impact of UI in QoL.

Key words: Urinary incontinence; Quality of Life; Women.

Urinary incontinence is frequently associated with a negative impact of quality of life of the patient. It is not really a disease, but rather a symptom, as a result of either a bladder or sphincter disorder. Urinary incontinence is defined by the International Continence Society (ICS) as “involuntary loss of urine”. The symptomatology of incontinence may be subdivided into three categories: *a)* stress urinary incontinence, which is caused by “the involuntary loss by effort, exercise, sneeze or cough”, *b)* urge incontinence, which is the “involuntary loss of urine accompanied by or following a sudden compelling desire to void which is difficult to defer”, and *c)* mixed urinary incontinence, which is defined as “the involuntary urine loss accompanied by urgency and present by effort, exercise, sneeze or cough”.¹ Women are more prone to the condition than men. This is because the incidence for each type of urinary incontinence in females ranges between 10% and 58% while incidence in men is estimated to be between 3% and 11% depending on the population checked and the definition used for incontinence.²

Although it is not a life-threatening condition, urinary incontinence has a physical and psychological affect on the patients, while at the same time it charges them with an additional financial burden. According to the World Health Organization (WHO), health is defined as the “condition of total physical, emotional and social health and prosperity”, disproving the previous opinion of the absence, mostly, of disease or disability. Even though, the prevalence of urinary incontinence is similar to other chronic diseases, research with regards to its effect on the quality of life of the patients have started only recently in the last fifteen years. Researchers have designed, developed and suggested the use of various questionnaires which are completed by the patients themselves, whereby via the appropriate questions the degree of the effect of urinary incontinence on the patients’ health and generally on their quality of life is revealed, graded and evaluated more objectively.³

Urinary incontinence, in whichever form, sweepingly affects the life of the patients. It is conceived as a lack of health which generates feelings of anger and sadness, as well as embarrassment and depression. Patients avoid social gatherings and lose self-confidence, which has a proportional impact on their social interactions, their sexual life and emotional health.^{4,5} Apart from the emotional repercussions, however, urinary incontinence is a risk factor for other physical conditions and diseases, while simultaneously being a financial burden on the patient and his or her family. In table 1, the physical, psychological and social impacts of the disease are summarized.

The ability of skin being a barrier between the internal and the external environment depends on its integrity, the presence of internal and external cellular lipids and its pH.

A disorder of its integrity or its histological structure, allows for the development of microbes such as staphylococcus. Secondary infection by *Candida albicans* is also frequent, which is also favoured by the humidity of the region. The contact of urine with skin also aids in the creation of paratrimma, as well as folliculitis. The perineal dermatitis or incontinence dermatitis refers to the dermatitis caused by urinary or fecal incontinence. It causes severe pain and inflammation in the vagina, the perineum and the buttocks. The increased humidity of the skin ultimately causes a mechanical damage. Erosions by friction are caused by half of the energy on wet skin than on dry skin. Therefore, urinary incontinence is a major risk factor for decubitus ulceration.⁶ Frequency, nocturia, urgency, as well as urge incontinence have also been shown to increase the risk of falls, which may lead to fractures and other morbidities.⁷

The direct relationship between urinary incontinence, stress and depression is already adequately documented. In a population study of 5701 women aged from 50 to 69 years old, Nygaard et al., discovered that women with severe urinary incontinence had an 80% greater possibility of presenting deep depression while women with incontinence

TABLE 1. – Physical, psychological and social incidence of urinary incontinence.

<i>Physical Incidences</i>
Bacterial infections
Fungal infections
Cellulitis, skin infections
Paratrimma
Decubitus ulcers
Falls and fractions
Sexual dysfunction
<i>Psychological Effects</i>
Stress
Depression
Loss of self-respect and self-confidence
Shame
<i>Social incidences</i>
Avoid of social events
Reduce personal activities
Social insularity
Loss of independence
Cost

of mild to average degree had 40% greater possibility of presenting depression.⁸ In another study, Mellville et al studied 218 patients with urinary incontinence and found that major depression and panic disorders very often correspond to women with urinary incontinence. In patients with urge or mixed incontinence the possibility is much higher for a psychological disorder to coexist. Coexistent severe depression significantly affects the degree in which the patient perceives incontinence, which is significant in altering quality of life and general functioning of the patient.⁹ In a third study in Baltimore, 5,024 patients were enrolled in order to identify the prevalence of overactive bladder symptoms and its effect on the quality of life. It was concluded that an overactive bladder, with or without incontinence, presents a clinically significant impact on the quality of life, on the quality of sleep and psychological health, both in men and women.¹⁰ In another prospective study of 82 women, the correlation between depression and incontinence is identified, especially in urge incontinence. While only 19.5% of women with effort incontinence report clinically significant depression, 44% of women with urge incontinence suffers from depression. In a recent mail study with 3,536 women, the incidence of depression appears to be analogous to the degree of incontinence, as well as to the degree of social isolation and quality of life.¹² Bogner et al showed that when urinary incontinence is severe enough, the incidence of a stress disorder increased by 4 times.¹³ Finally, a large and long-term study with 12568 women aged over 40 years, showed that stress and depression episodes may be predicted by the preexistent urge incontinence. In this study, 56.5% of those who answered reported intense and frequent stress, while 37.6% suffered from depression of severe degree.¹⁴ Recent guidelines recommend that women with medium and severe incontinence be screened for coexisting depression and to be treated accordingly.¹²

Heavy psychological issues in adults may sometimes have roots in continence status, urinary control and independence acquired during childhood. As children approach the age of 2 years, they recognize that they can control when they sleep, when and what they eat and when they urinate and thus they acquire a feeling of independence and personality. This important initial stage of development prepares the child for the life ahead. When, however, later in life incontinence is exhibited, this regression and loss of control may have serious consequences. Self-confidence is reduced by the disability to control the bladder and by matters such as cleanliness, which already contribute to the psychological problems. Often, too, this may be accompanied by alienation from family and friends and this may be additionally detrimental to the patient's self-confidence.¹⁵

The above studies all demonstrate that urinary incontinence is an obstacle in good physical and social well-being and consequently it is an obstacle to the patient's maintenance of general fitness. In a large European randomised study with 9487 women, more than 60% of them with medium to severe symptoms reported restriction in their activities, including physical exercise, due to a possible incontinence episode.¹⁶ Brown et al reviewed the information collected by more than 41000 women in the Australian Longitudinal Study on Women's Health (ALSWH) and found that more than 33.3% of women between the ages of 45 and 50 report that they avoid athletic activities fearing an incontinence episode during exercise.¹⁷ Finally, in an American study 3364 women were examined using the International Physical Activity Questionnaire (IPAQ). In this study, it was revealed that women with severe incontinence have 2.64 times greater possibility not to exercise, in comparison to continent women. Also, 85.3% of women with severe

incontinence consider their problem as being a chief obstacle to physical exercise, compared to the 64.5% of women with average incontinence.¹⁸ And of course, apart from the important psychosocial parameters, avoidance of physical exercise increases the risk for many other diseases, such as osteoporosis, hypertension, coronary heart disease, etc.¹⁷

Urinary Incontinence is related to reduced personal and social life and to reduced total quality of life. It may seriously affect sociability, and the social gatherings the patient attends are modified so that possible unpleasant moment and embarrassment by sudden loss of urine are avoided.¹⁹ Urge incontinence especially may have an especially intense and negative impact on the quality of life as it affects social presence, psychological mood, work environment, family surroundings and fitness and sexual life.⁵ Urgent incontinence affects healthy way of life than incontinence by effort, because a hyperactive bladder is harder to control, more often it will interrupt sleep or other daily activities and more possible may lead to loss of urine of more than 50 ml, as may occur in a typical episode of incontinence by effort.²⁰ Various ways and strategies that the patients' uses and more especially the avoidance of social activity due to possible "leak" may further affect health.²¹

The matter of incontinence is often just a reason for the loss of independence for elderly people. In a study, urinary incontinence is "incriminated" as a steady prediction factor either for hospitalization, either for being committed to an institution, with relative hospitalization risk 1.3 in women and 1.5 in men and relative institutionalization risk 2 and 3.2 respectively.²² Urge incontinence is also a predictor for institutionalization, with relative risk being 3.07 (95% CI 1,24-7,50) in comparison to 1.15 for the age (95% CI , 1,10-1,19) and 1.22 for depression (95% CI 1,27-3,21).²³

Also important, is the disorder caused by urinary incontinence in normal sexual function. Shaw in 2002 presented a review of articles in English language since 1980, whereby sexual dysfunction incidence, due to urinary incontinence ranged from 2% to 64%.²⁴ In an Austrian study, which evaluated incontinence by information gathered from questionnaires, it was found that from the total of patients who report urinary incontinence, 30.5% reports simultaneous sexual dysfunction, as a consequence of loss of urine.²⁵ In another study, which evaluated the impact of urinary incontinence in sexual function in premenopausal women, researchers discovered that urinary incontinence, both by stress and urge, significantly reduce sexual function in sexually active women, with patients reporting lower scores of desire, stimulation, lubrication of the vagina, orgasm and satisfaction, but not in pain.⁴ Salonia et al established 46% of 216 women, who were diagnosed with urinary incontinence with the use of questionnaires, physical and urodynamics examination, exhibited sexual dysfunction. Sexual dysfunction in these women, was diagnosed with the FSFI (female sexual function index). Of these women 34% reports loss of sexual desire, 23% difficulty in sexual stimulation and 11% complained about difficulty in orgasm.²⁶ In another multicentre study, with mailed questionnaires which concerned urinary incontinence after surgical operation for pelvic organ prolapse, Morgan et al. found that incontinence in these women was related to low possibility of sexual activity. Among sexually active women, the risk of sexual dysfunction was analogous to the degree of incontinence.²⁷

The total impact of urinary incontinence on quality of life was estimated in an Austrian study, which evaluated 2,498 women (mean age 49.7 years old) and 1,236 men (mean age 48.6 years old). It was discovered that 65.7% of the women and 58.3% of the men consider that the disorder was detrimental to their quality of life and indeed 18.3% and 16.6%

stated that the detriment was average to grave. Additionally, this detriment was correlated statistically significantly both with the degree and the incidence as well as with the number of pads and other urine collection devices. The impact on way of life is multi-factored causing problems in social activities, in maintaining a good physical exercise though sports and in assurance of independence.²⁵

Kelleher et al designed and created the King's Health Questionnaire (KHQ) a questionnaire of 21 points to estimate the quality of life of women with urinary incontinence. In the initial evaluation it was discovered that the great majority of women, in spite of the urodynamic findings, felt that incontinence affected their quality of life negatively, with incidence of 66.6% among women with mixed type incontinence up to 81.2% among women with hyperactive detrusor. The most frequent complaints were irritation by humidity, smell and the need to wear pads, change their wet underwear regularly, restrict their fluid input and avoid specific clothes.²⁸

CONCLUSION

The destructive consequences of urinary incontinence to the psychology and the sexual and social life of the patients, in combination with the significant financial impact on the society, requires a change in the way of thinking with regards diagnosis and treatment of this quite wide-spread disorder. And even though full continence is not always feasible, important improvement may usually be achieved in most patients, so that a normal way of life can be maintained.

ACKNOWLEDGEMENTS to Zoe Charalambous for editing

B.A (Hons) English Literature and Creative writing (Warwick), M.A Classics (UCL).

BIBLIOGRAFIA

- Abrams P et al. The standardisation of terminology in lower urinary tract function: report from the standardisation sub-committee of the International Continence Society. *Urology* 2003; 61: 37-49.
- Hunnskaar et al. Epidemiology and natural history of urinary incontinence. In: *Incontinence*. Edited by P. Abrams, S. Khoury and A. Wein. London: Health Publications, pp. 199-226, 1999.
- Corcos J et al. Quality assessment in men and women with urinary incontinence. *J Urol* 2002; 168: 896-905.
- Aslan G et al. Sexual function in women with urinary incontinence. *Int J Impot Res* 2005; 17: 248-251.
- Tubaro A. Defining overactive bladder: epidemiology and burden of disease. *Urology* 2004; 64: 2-6.
- Farage MA et al. Incontinence in the aged: contact dermatitis and other cutaneous consequences. *Contact Dermatitis* 2007; 57: 211-217.
- Brown JS et al. Urinary incontinence: does it increase risk for falls and fractures? *J Am Geriatr Soc* 2000; 48: 721-725.
- Nygaard I et al. Urinary incontinence and depression in middle-aged United States women. *Obstet Gynecol* 2003; 101: 149-156.
- Melville et al. Prevalence of comorbid psychiatric illness and its impact on symptom perception, quality of life, and functional status in women with urinary incontinence. *Am J Obstet Gynecol* 2002; 187: 80-7.
- Stewart WF et al. Prevalence and burden of overactive bladder in the United States. *World J Urol* 2003; 20: 327-36.
- Stach-Lempinen Bet al. Severe depression determines quality of life in urinary incontinent women. *Neurourol Urodyn* 2003; 22: 563-568.
- Melville JL et al. Incontinence severity and major depression in incontinent women. *Obstet Gynecol* 2005; 106: 585-592.
- Bogner HR et al. Anxiety disorders and disability secondary to urinary incontinence among adults over age 50. *Int J Psychiatry Med* 2002; 32: 141-154.
- Perry S et al. An investigation of the relationship between anxiety and depression and urge incontinence in women: development of a psychological model. *Br J Health Psychol* 2006; 11: 463-482.
- Miner PB. Economic and Personal Impact of Fecal and Urinary Incontinence. *Gastroenterology* 2004; 126: S8-S13.
- DuBeau CE et al. The impact of urge urinary incontinence on quality of life: importance of patients' perspective and explanatory style. *J Am Geriatr Soc* 1998; 46: 683-692.
- Brown WJ et al. Too wet to exercise? Leaking urine as a barrier to physical activity in women. *J Sci Med Sport* 2001; 4: 373-378.
- Nygaard I et al. Is urinary incontinence a barrier to exercise in women? *Obstet Gynecol* 2005; 106: 307-314.
- Millard RJ, Moore KH. Urinary incontinence: the Cinderella subject. *Med J Aust* 1996; 165: 124-125.
- Specht JKP. 9 myths of incontinence in older adults: both clinicians and the over-65 set need to know more. *Am J Nurs* 2005; 105: 58-68.
- Miller J, Hoffman E. The causes and consequences of overactive bladder. *J Womens Health* 2006; 15: 251-260.
- Thom DH et al. Medically recognized urinary incontinence and risks of hospitalization, nursing home admission and mortality. *Age Ageing* 1997; 26: 367-374.
- Nuotio M et al. Predictors of institutionalization in an older population during a 13-year period: the effect of urge incontinence. *J Gerontol A Biol Sci Med Sci* 2003; 58: 756-762.
- Shaw C. A systematic review of the literature on the prevalence of sexual impairment in women with urinary incontinence and the prevalence of urinary leakage during sexual activity. *Eur Urol* 2002; 42: 432-440.
- Temml C et al. Urinary incontinence in both sexes: prevalence rates and impact on quality of life and sexual life. *Neurourol Urodyn* 2000; 19: 259-271.
- Salonia A et al. Sexual dysfunction is common in women with lower urinary tract symptoms and urinary incontinence: results of a cross-sectional study. *Eur Urol* 2004; 45: 642-8; discussion 648.
- Morgan DM et al. Are persistent or recurrent symptoms of urinary incontinence after surgery associated with adverse effects on sexual activity or function? *Int Urogynecol J Pelvic Floor Dysfunct* 2008; 19: 509-15.
- Kelleher CJ et al. A new questionnaire to assess the quality of life of urinary incontinent women. *Br J Obstet Gynaecol* 1997; 104: 1374-1379.

Corresponding Author:

STAVROS N. CHARALAMBOUS MD, PhD, FEBU
Urological Surgeon
Associate Director
Head of Female Urology, Neurourology and Urodynamics
Ippokratio General Hospital
Thessaloniki, Greece
www.uroclinic.gr
email: st.charalambous@ippokratio.gr
Tel: +30 2310 347272
Fax: +30 2310 826666
Office: +30 2313312007
Mob: +30 694 77 28 580

7 – PAIN

Endothelin receptors and pain. *Khodorova A, Montmayeur GP, Strichartz G. J Pain. 2009;10:4.* The endogenous endothelin peptides participate in a remarkable variety of pain-related processes. Pain elevated by inflammation, skin incision, cancer, etc, is reduced by local administration of antagonists of endothelin receptors. Many effects of endogenously released endothelin are simulated by acute, local subcutaneous administration of endothelin, which at very high concentrations causes pain and at lower concentrations sensitizes the nocifensive reactions to mechanical, thermal and chemical stimuli.

Reliability of a continuous pain score meter: real time pain measurement. *Boormans EM, van Kesteren PJ, Perez RS et al. Pain Pract. 2009;9:100.* A new continuous algometer is based on the principles of the visual analog score (VAS), and electronically measures pain score in a continuous, instead of a single, manner. The test-retest reliability was successfully established. The real-time continuous pain measurement may provide more detailed information on a subjects' pain perception compared to a single VAS, in particular during an interval of pain stimuli.

Laparoscopic management of endopelvic etiologies of pudendal pain in 134 consecutive patients. *Possover M. J Urol. 2009;181:1732.* In patients with seemingly inexplicable anogenital pain, especially after failed treatment for Alcock's canal syndrome, laparoscopic exploration of the pelvic nerves must be done for further diagnosis and therapy before prematurely labeling the patients as refractory to treatment. 134 consecutive patients after laparoscopy for refractory anogenital pain were retrospectively reviewed. All neurosurgical procedures, such as neurolysis/decompression of the pudendal nerve and the sacral nerve roots or neuroelectrode implantation to the sacral plexus for postoperative neuromodulation, were done via the laparoscopic transperitoneal approach to the pelvic nerves.

Genetics and phenotyping of urological chronic pelvic pain syndrome. *Dimitrakov J, Guthrie D. J Urol. 2009;181:1550.* Urological chronic pelvic pain syndromes (interstitial cystitis/painful bladder syndrome and chronic prostatitis), are a group of medically unexplained physical symptoms. An emerging body of research implicates systemic factors including abnormal sympathetic nervous system, hypothalamic-pituitary-adrenal axis activity and also a genetic mechanisms. An approach of rigorous phenotyping, increasing lines of evidence of familial clustering and twin studies identified genetic risk factors for disease. A genome-wide approach to the study of urological chronic pelvic pain syndromes is suggested.

Pudendal neuralgia. Fact or fiction? *Stav K, Dwyer PL, Roberts L. Obstet Gynecol Surv. 2009;64:190.* Chronic pelvic pain in women includes: pudendal neuralgia and entrapment neuropathies. The prevalence of PN is unknown and it seems to be a rare event. The main feature is neuralgic pain in the distribution of the pudendal nerve. The most common patient's profile is a patient who had seen multiple physicians, with no evidence of organ disease, normal urogynecological and colorectal evaluations, and failed multiple pharmacologic treatments. It is believed that neuronal insult caused by stretching or compression is the primary etiology. PN is said to be a diagnosis of exclusion and requires a high index of suspicion.

8 – FISTULAE

A case of vesicocutaneous fistula to the thigh. *Kosaka T, Asano T, Azuma R et al. Urology 2009;73:929.e7.* A case of vesicocutaneous fistula to the thigh developed 7 years after an injury to the pelvis. A 34-year-old male patient was referred because of a water-soluble yellow exudate from his left thigh. A urinary fistula was suggested by the results of an intravenous indigo carmine injection. Intravenous pyelography and computed tomography revealed the presence of a bladder deformation and a fistula originating at the ventral bladder wall and leading down to the left thigh. The patient underwent fistulectomy and partial cystectomy.

Anastomotic-vaginal fistula after anterior resection of the rectum for cancer - occurrence and risk factors. *Matthiessen P, Hansson L, Sjødahl R, Rutegård J. Colorectal Dis. 2009 Feb 7. [Epub].* Anastomotic-vaginal fistula forms a significant part of all symptomatic leakages after low anterior resection for cancer in women. Although diagnosed later, the need for abdominal reoperation and defunctioning stoma was not different from patients with conventional leakage. Risk factors include low anastomosis, preoperative radiotherapy, and UICC cancer stage IV. Previous hysterectomy is not a risk factor.

Perianal mucinous adenocarcinoma arising from chronic anorectal fistulae: a review from single institution. *Yang BL, Shao WJ, Sun GD et al. Int J Colorectal Dis. 2009 Feb 10. [Epub].* Fistula-associated perianal mucinous adenocarcinoma is an uncommon malignant transformation of chronic fistula-in-ano. MRI can provide important diagnostic information on patient with this suspicious inflammatory condition. Radical resection of the tumour with abdominoperineal resection and chemoradiotherapy are the treatments of choice.

A retrospective review of chronic anal fistulae treated by anal fistulae plug. *El-Gazzaz G, Zutshi M, Hull T. Colorectal Dis. 2009 Feb 7. [Epub].* Thirty-three patients with cryptoglandular (61%) and Crohn's disease (39%) underwent 49 plug (Cook Surgisis®) insertions. The median follow up was 221.5 days (range 44-684). The overall success rate was 25%, lower than previously reported. Two of the 22 Crohn's fistulae and 9/26 cryptoglandular fistulae healed. The reasons for failure were sepsis in 87% and plug dislodgement in 13%. Significant predictor factors for improved outcome was the presence of seton.

9 – BEHAVIOUR, PSYCHOLOGY, SEXOLOGY

Web-based survey on the effect of menopause on women's libido in a computer-literate population. *Cumming GP, Currie HD, Moncur R, Lee AJ. Menopause Int. 2009;15:8.* An active sex life was deemed to be important but many women were not seeking help for menopause-related reduced libido causing distress. For many, vaginal changes contributed to their symptoms. In those seeking advice, treatment was commonly not prescribed. Health professionals must ask appropriate direct questions to all women, especially as part of menopausal assessment. There is a need to validate the Brief Profile of Female Sexual Function in non-postmenopausal women.

Ageing, mate preferences and sexuality: a mini-review. *Oberzaucher E, Grammer K. Gerontology. 2009 Feb 20. [Epub].* The need to increase both the likelihood of gametes to encounter each other as well as sufficient provision of nutrition for the offspring leads to the evolution of two sexes. The most obvious function of sexual behavior is reproduction. To foster the benefits for the offspring, reproduction partners should also develop an emotional bond, which is mediated by hormones connected to sexual intercourse. With increasing age, reproduction loses importance, while pair bonding functions remain relevant. Therefore, sexuality never ceases to be part of a relationship.

10 – MISCELLANEOUS

Postmenopausal estrogen-containing hormone therapy and the risk of breast cancer. *Jick SS, Hagberg KW, Kaye JA, Jick H. Obstet Gynecol. 2009;113:74.* There is no materially increased risk of breast cancer in users of estrogen alone or esterified estrogen with methyltestosterone compared with nonusers. There is an increased risk among those using conjugated estrogen plus progestin. In particular, the risk of breast cancer in women who used conjugated estrogen plus progestin for 4 or more years is approximately three times higher than in women who are not exposed to hormone therapy.

Sham feed or sham? A meta-analysis of randomized clinical trials assessing the effect of gum chewing on gut function after elective colorectal surgery. *Parnaby CN, Macdonald AJ, Jenkins JT. Int J Colorectal Dis. 2009;24:585.* Gum chewing significantly reduced time to flatus and feces; however, hospital stay and postoperative complications were not reduced. Significant study heterogeneity means that these results should be interpreted with caution.

The prebiotic effects of a new mixture of soluble fermentable fibres in the treatment of chronic constipation

LUCA AMADIO - ERICA STOCO - GIUSEPPE DODI

Department of Surgery, Clinica Chirurgica 2, University of Padova, Italy

INTRODUCTION

Chronic constipation is a multifactorial polysymptomatic disorder very common in the western population. Though constipation is a widespread condition, its real prevalence and incidence are difficult to quantify because of the definition itself, which varies among physicians and laypersons, and because only a small part of people who perceive they have constipation seek health care. Chronic constipation has become a significant health problem, especially in the female population. It is associated with impairment of quality of life and high levels of psychological distress.¹

A recent systematic review estimates the prevalence of constipation in Europe to be 17.1% (median value 16.6%)² and epidemiologic studies based on householder surveys in North America suggest a prevalence of 15% to 20% especially in people over 65 years old with a ten year cumulative incidence estimated at 17.4%.³⁻⁶ These prevalence rates were calculated using the Rome II criteria. However for self-reported constipation the prevalence rises up to 29.5% with approximately 1/3 of subjects dissatisfied with their bowel function.⁷⁻⁸

Idiopathic chronic constipation can be divided into slow transit constipation, outlet defecation syndrome and functional constipation but it is possible for different types to exist in the same patient with an overlapping of different subtypes. Many factors are implicated in the causation of chronic constipation: age, sedentary lifestyle, insufficient intake of fluid and fibre and a wide range of conditions such as medication, endocrine and metabolic disorders, neurological and gastrointestinal disease.⁹

Fibres are an important index of quality of a balanced diet.¹⁰ Epidemiological studies have suggested that there is a critical faecal wet weight of 160-200 gr/day for adults below which transit time falls.¹¹ Using this critical faecal mass the adequate daily intake of dietary fibre ranges from 30 to 40 gr/day (14g per 1000 Kcal).¹² Fibres are a wide variety of substances that belong to the family of carbohydrate and are not absorbed by the human digestive tract.¹³

High-fibre diet and prescription of fibre like bulking agents are very common in primary and secondary care management of constipation. Products with different types of fibres have been available for constipated people: wheat bran and dietary supplements with active ingredients like arabic gum, partially hydrolyzed guar gum, psyllium pectins, methylcellulose.

In our study we decided to treat constipated patients with the association of gum arabic (GA) and fructo-oligosaccharides (FOS). GA is a soluble fermentable resin containing 85% of fibre obtained from the natural agriculture with a prebiotic effect favouring the growth of Bifidobacteria, Bacterioides and acidogenic bacteria.¹⁴

The GA is a dried exudate of the acacia tree (*Acacia senegal*), a tree commonly encountered in various tropical and subtropical regions of the world and prevalently in Sudan. It is a heteropolysaccharide of high molecular weight (approximately 350-850 kDa) containing galactose, rhamnose, glu-

curonic acid and arabinose residues and also minerals like calcium, potassium and magnesium.¹⁵ GA is a fermentable soluble substance with mechanical and metabolic effects: delaying gastric emptying, increasing faecal bulk and frequency of bowel movements, regulating colonic transit time, slowing glucose absorption from the small intestine with reduction of postprandial blood, serum total cholesterol and low density lipoproteins.¹⁶⁻¹⁹

The FOS and inulin when present in diet are the only short-chain carbohydrates prebiotics that had shown a significant increase in stool output in constipated patients, due to a modification of micro-organisms in the gut.²⁰⁻²²

The aim of our pilot study is to evaluate the effectiveness of an association between GA and FOS (FD Fibre Liquid, Dalco srl, Mirano-Venice, Italy) in the treatment of chronic constipation. The blend would combine effects of the soluble fibre with prebiotic effect of the short chain carbohydrate.

PATIENTS AND METHODS

Patients were recruited from the outpatient clinic of the Department of Surgery, University of Padua, Italy (Clinica Chirurgica 2) and were observed over a fifteen week period. Inclusion criteria were age 18-90 years with functional constipation as defined by the Rome III criteria.²³ Exclusion criteria were concomitant medication that could modify bowel transit, inflammatory bowel diseases, previous gastrointestinal surgery, severe liver, cardiac and kidney diseases, pregnancy, uncontrolled diabetes. All subjects gave written informed consent.

Patients were evaluated with the I.P.G.H. scoring system (Incontinence, Pelvic floor, General, Handicap)²⁴⁻²⁵ and constipation was quantified by the "constipaq score system" (Tab. 1) a modified Constipation Scoring System (CSS).²⁶ Constipation was classified as mild for a constipaq score 6-10, moderate for 11-15 and severe for score >15. To exclude obstructive causes of constipation all patients had a colonoscopy or a barium enema.

A basal intestinal transit time study was performed in all patients. In patients with suspected obstructed defecation (Obstructed Defaecation Syndrome Score >9),²⁷ also a defecography was done.

Constipation was evaluated with a diary where the patients indicated the time of bowel movements, obstruction/straining/anal pain at defecation (yes/no), sense of incomplete evacuation (yes/no), abdominal discomfort/bloating/pain (yes/no), time spent in toilet (minutes), help for defecation (laxatives, suppositories, enema, digitations), number of unfruitful attempts, impairment of the daily activities (mild, moderate, severe, i.e. quality of life scale 0-3).

At visit 1 medical history was collected, a physical examination performed and the constipaq score calculated.

At visit 2, after a 21-days washout period, when the patients avoided laxatives or enemas, the score was calculated according to the diary. If the score was more than 5, patients were given daily active treatment for three weeks: 11.7 g of GA plus 4.7 g of FOS. During the treatment period

TABLE 1. – Constipaq system code.

C	<i>stool frequency (number of defecation)</i>	O	<i>obstruction, pain, straining</i>
0	>2 per week	0	never
1	2 per week	1	< 1 per month
2	1 per week	2	1-4 per month
3	<1 per week	3	1-2 per week
4	<1 per month	4	>2 per week
N	<i>incomplete defecation</i>	S	<i>abdominal discomfort, pain, bloating</i>
0	never	0	never
1	< 1 per month	1	< 1 per month
2	1-4 per month	2	1-4 per month
3	1-2 per week	3	1-2 per week
4	>2 per week	4	>2 per week
T	<i>time spent in toilet (minutes)</i>	I-P	<i>helps for defecation</i>
0	<5	0	<1 per week
1	5-10	1	laxatives, suppositories I ≥1 per week
2	10-20	2	enema, digitation P ≥1 per week
3	20-30		
4	>30		
A	<i>unfruitful attempts(n°)</i>	Q	<i>duration of constipation (year)</i>
0	never	0	<1
1	1-3 per day	1	1-5
2	4-6 per day	2	6-10
3	7-9 per day	3	11-20
4	>9 per day	4	>20

$$\text{constipaq} = \text{CCS} (0..30) + \text{number of capital letters} (0..9) + \text{QoL} (0..3) \times n$$

no other medications were allowed for constipation. The score was calculated at the end of the treatment (visit 3) and at the end of the following 9 weeks (visit 4).

At each visit patients returned the diary and underwent a physical examination. At visit 3 they were asked about tolerability of treatment (smell, taste, modality of intake). The presence of other symptoms including abdominal pain or cramps, bloating or nausea was recorded. Serious adverse events were communicated immediately by the patients.

STATISTICAL ANALYSIS

The population size of the study could not be determined previously due to the lack of information on the subject; this

TABLE 2. – Demographic data.

Parameter	Group A (15) AG-FOS
<i>Sex, n (%)</i>	
Female	15
Male	0
<i>Age (years)</i>	
Mean	60.2
Range(min-max)	(41-71)
<i>Weight (Kg)</i>	
Mean	64.9
Range(min-max)	(55-84)
<i>Height</i>	
Mean	160.3
Range(min-max)	(154-170)

is the reason why the study is defined as pilot. A descriptive analysis was performed by evaluating sex, age, weight and height distribution in the study population. The treatment efficacy was studied comparing the data at the three visits by means of homoschedastic “t” test; the results were considered significant for p < 0.05.

RESULTS

From November 2006 to February 2008 fifteen women were enrolled. The demographic features of the population study are summarized in Tab. 2.

Seven patients (47%) had been constipated for more than 10 years. Fourteen patients (93%) had consulted less than three doctors for their problem.²⁸⁻³⁰ The mean constipaq score at the enrolment was 21.4±4.7 with 14 (93%) severely and 1 (7%) mildly constipated patients (Tab. 3, Fig. 1-2). The mean Obstructed Defaecation Syndrome Score was 9.4±2.2.

After the treatment (visit 3) the mean score decreased significantly to 16±7.7 (p<0.001) (Tab. 3, Fig. 1-2): 12 patients showed a reduction of the score from severe to mild (7) or moderate (5) constipation. A reduction in the score was anyway observed in the three patients still suffering for a severe constipation. The Obstructed Defaecation Syndrome Score fall to a mean value of 6.8±3.

Before the treatment patients were mildly (9) and moderately (4) limited in their daily activities due to difficult defecation, sense of incomplete evacuation and abdominal discomfort/bloating/pain. After treatment there was a significant improvement in quality of life. In Tab. 3 the quality of life score is the result of QoL scale (0-3) multiplied for the number of doctors consulted for constipation. At visit three the improvement in constipation symptoms was related to

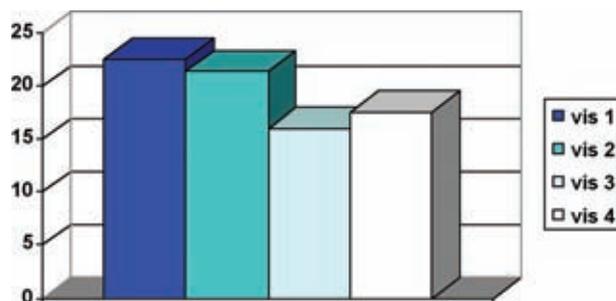


Fig. 1. – Constipaq score.

a better quality of life with the reduction of the score ($p < 0.05$) (Tab. 2).

The score reduction after 9 weeks (visit 4) was also significant compared to visit 2, with an improvement of QoL ($p < 0.05$) (Tab 2).

DISCUSSION

From 1990 to 2005 in our Proctology and Pelvic Floor Unit 4823 constipated patients with a score $>5/30$ sought a solution for their problem. The three different subtypes of chronic constipation (functional, slow transit, outlet obstruction) could be treated with nutritional lifestyle measures (physical activity, fibre-enriched diet, fibre supplements) and/or with out-patients treatment (pelvic floor muscle rehabilitation, rubber band ligation). Surgical options for severe constipation resistant to conservative treatment consist of abdominal or perineal procedures: subtotal colectomy in case of inertia coli and correction of internal rectal prolapse or rectocele. Recently sacral nerve stimulation became an option for intractable constipation. Quite often however different subtypes coexist and one treatment does not solve the problem.³¹

Dietary modification with improvement of daily intake of fibres is the first step in the treatment of this chronic bowel dysfunction. Patients' low compliance for fibre bulking agents is usually due to their taste and/or the discomfort related to abdominal pain and bloating. Moreover fibre must be introduced continuously to be effective. The association of GA (a resin and not a common fibre obtained by seeds) and FOS thanks to their prebiotic action is indicated to overcome these problems.

In order to achieve the prebiotic effects favouring the proliferation of lactic acid-producing bacteria and Bifidobacteria in faecal specimen, 5-10 g per day of GA is needed.^{14,32}

The FOS and inulin are the only oligosaccharides able to increase the faecal mass and a daily dose of 5-20 g can stimulate the growth of health promoting species (Bifidobacterium and Lactobacillus) in the stool.^{22,22,33} The FOS are rapidly fermented in the proximal bowel with a gas production increase and bloating.³⁴ This complaint has seldom been reported by a patient.

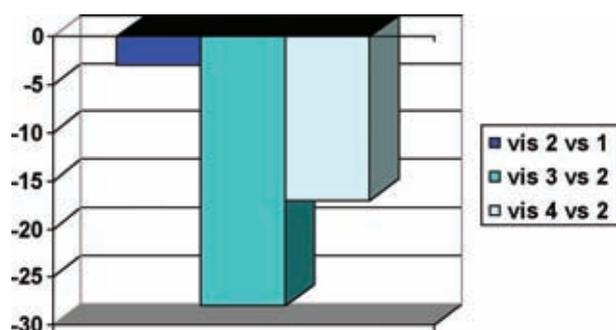


Fig. 2. – Reduction of constipaq score (%).

TABLE 3. – Constipaq score in population study.

Parameter	Group A (15) GA-FOS
C	
Visit 1	0.53
Visit 2 (wash-out)	0.07
Visit 3	0.07
Visit 4	0.00
O	
Visit 1	3.00
Visit 2 (wash-out)	2.67
Visit 3	1.93
Visit 4	2.93
N	
Visit 1	3.40
Visit 2 (wash-out)	3.67
Visit 3	2.8
Visit 4	3.2
S	
Visit 1	3.00
Visit 2 (wash-out)	3.53
Visit 3	2.93
Visit 4	3.04
T	
Visit 1	0.8
Visit 2 (wash-out)	0.8
Visit 3	0.6
Visit 4	0.33
IP	
Visit 1	1.53
Visit 2 (wash-out)	1.4
Visit 3	0.93
Visit 4	1.07
A	
Visit 1	0.93
Visit 2 (wash-out)	0.87
Visit 3	0.53
Visit 4	0.47
Q	
constipaq score (\pm SD)	
Visit 1	22.6 \pm 5.5
Visit 2 (wash-out)	21.4 \pm 4.7
Visit 3	*16 \pm 7.7
Visit 4	***17.6 \pm 6.8
Quality of life score(\pm SD)	
Visit 1	2.9 \pm 2.1
Visit 2 (wash-out)	2.1 \pm 2.5
Visit 3	***1.1 \pm 1.4
Visit 4	***0.8 \pm 1.3

* $p < 0.001$; ** $p < 0.005$; *** $p < 0.05$ per visit 3 vs visit 2 and visit 4 vs visit 2.

The patients' quality of life was low due to the need to straining, feeling of anal obstruction and of incomplete defecation, abdominal discomfort, pain and bloating. Following treatment there was a significant improvement in patient satisfaction with a reduction of the QoL as well as of the CSS/constipaq scores. A 37% decrease in the obstructive defecation score was also observed, but the difference was not statistically significant probably due to the sample size.

In the literature the use of FOS as a dietary supplement has been reported in association with cereals and partially

hydrolysed guar gum.³⁵⁻³⁶ The good taste and the long term effects of the association between GA and FOS make this mixture a promising new first option for the treatment of functional constipation.

REFERENCES

- Chang L, Toner BB, Fukudo S, et al. Gender, age, society, culture, and the patient's perspective in the functional gastrointestinal disorders. *Gastroenterology* 2006; 130: 1435-46.
- Peppas G, Alexiou VG, Mourtzoukou E, Falagas ME. Epidemiology of constipation in Europe and Oceania: a systematic review. *BMC Gastroenterol* 2008; 8: 5.
- Pare P, Ferrazzi S, Thompson WG, et al. An epidemiological survey of constipation in Canada: definition, rates demographics, and predictors of health care seeking. *Am J Gastroenterol* 2001; 96: 3130-7.
- Sonnenberg A, Koch TR. Physician visits in the United States for constipation: 1958 to 1986. *Dig Dis Sci* 1989; 34: 606-11.
- Higgins PD, Johanson JF. Epidemiology of constipation in North America: a systematic review. *Am J Gastroenterol* 2004; 99: 750-9.
- Choung RS, Loche GR, Schleck CD, Zinsmeister AR, Talley NJ. Cumulative incidence of chronic constipation: a population-based study 1988-2003. *Aliment Pharmacol Ther* 2007; 26: 1521-1528.
- Garrigue V, Galvez C, Ortiz V, Ponce M, Nos P, Ponce J. Prevalence of constipation: agreement among several criteria and evaluation of the diagnostic accuracy of qualifying symptoms and self-reported definition in a population-based survey in Spain. *Am J Epidemiol* 2004; 159: 520-520.
- Hammond E. Some preliminary findings on physical complaints from prospective study of 1,064,004 men and women. *Am J Pub Health* 1964; 54: 11-23.
- Fernando Fernández-Baneres. Nutritional care of the patient with constipation. *Best Pract Res Clin Gastroenterol* 2006; 20: 575-587.
- Biltoft-Jensen A, Fagt S, Groth MV, Matthiessen J, Wachmann HC, Christensen T. The intake of saturated fat and dietary fibre: a possible indicator of diet quality. *Br J Nutr* 2008; 20: 1-9.
- Birkett AM, Jones GP, De Silva AM, Young GP, Muir GP. Dietary intake and faecal excretion of carbohydrate by Australians: importance of achieving stool weights greater than 150 g to improve faecal markers relevant to colon cancer risk. *Eu J Clin Nutr* 51: 625-632.
- Dietary Guidelines Advisory Committee Report. Available on-line at: <http://www.health.gov/dietaryguidelines/dga2005/report>; 2005.
- Yoon SJ, Chu DC, Juneja LR. Chemical and physical properties and application of partially hydrolyzed guar gum as dietary fiber. *J Clin Biochem Nutr* 2008; 42: 1-7.
- Wyatt GM, Bayliss CE, Holcroft JD. A change in human faecal flora in response to inclusion of gum arabic in the diet. *Br J Nutr* 1986; 55: 261-6.
- Williams PA, Phillips GO (2000). Gum arabic. In *Handbook of hydrocolloids*, pp 155-168. GO Phillips and PA Williams editors. Boca Raton, FL. CRC Press.
- Council on Scientific Affairs. Dietary fibre and health. *JAMA* 1989;262:542-546
- Corinaldese R, Stanghellini V, Bocci G, Galassi A, Fraticco A, Miglioni M. Dietary fibre and intestinal transit times. *Curr Ther Res* 1982; 31: 173-180.
- Burkitt D. Fibre as protective against gastrointestinal disease. *Am J Gastroenterol* 1984; 79: 249-252.
- Burkitt DP, Meisner P. How to manage constipation with high-fibre diet. *geriatrics* 1979; 34: 33-40.
- Gibson GR, Beatty ER, Wang X, Cummings JH. Selective stimulation of bifidobacteria in the human colon by oligofructose and inuline. *Gastroenterology* 1995; 108: 975-982.
- Chen HL, Lu YH, Lin JJ, Ko LY. Effects of fructooligosaccharide on bowel function and indicators of nutritional status in constipated elderly men. *Nutr Res* 2000; 20: 1725-33.
- Chen HL, Lu YH, Lin JJ, Ko LY. Effects of isomalto-oligosaccharides on bowel functions and indicators of nutritional status in constipated elderly men. *J Am Coll Nutr* 2001; 20: 44-9.
- Longstreth GF, Thompson WG, Chey WD, et al. Functional bowel disorders. *Gastroenterology* 2006; 130: 1480-91.
- Artibani W, Benvenuti F, Di Benedetto P, Dodi G, Milani R. Staging of female urinary incontinence and pelvic floor disorders. Proposal of ipgh system. *Urodynamic, eurourology, Urodynamics & Continence* 1996; 6: 1-5.
- Farnsworth B, Dodi G. Short-IPGH system for assessment of pelvic floor disease. *Pelviperiology* 2007; 26: 73-77. www.pelviperiology.org.
- Agachan F, Chen T, Pfeifer J, Reissman P, Wexner SD. A constipation scoring system to simplify evaluation and management of constipated patients. *Dis Colon Rectum*. 1996; 39: 681-5.
- Altomare DF, Spazzafumo L, Rinaldi M, Dodi G, Ghiselli R, Piloni V. Set-up and statistical validation of a new scoring system for obstructed defaecation syndrome. *Colorectal Dis* 2008; 10: 84-8. Epub 2007 Apr 18.
- Sandler RS, Drossman DA, Nathan HP, Mckee DC. Symptom complaints and health care seeking behaviour in subject with bowel dysfunction. *Gastroenterology* 1984; 87: 314-8.
- Smith RC, Greenbaum DS, Vancouver IB et al. Psychosocial factors are associated with health care seeking rather than diagnosis in IBS. *Gastroenterology* 1990; 98: 293-301.
- Whitehead WE, Bosmajian L, Zonderman AB et al. Symptoms of psychologic distress associated with IBS. *Gastroenterology* 1988; 95: 709-14.
- Pescatori M, Spyrou M, Pulvirenti D'Urso A. *Colorectal Dis*. 2007; 9: 452-6.
- Calame W, Weseler AR, Viebke C, Flynn C, Siemensma AD. Gum arabic establishes prebiotic functionality in healthy human volunteers in a dose-dependent manner. *Br J Nutr* 2008; 100: 1269-75. Epub 2008 May 9.
- Gibson GR, Beatty ER, Wang X, Cummings JH. Selective stimulation of bifidobacteria in the human colon by oligofructose and inuline. *Gastroenterology* 1995; 108: 975-982.
- Cummings JH, Macfarlane GT. Gastrointestinal effects of prebiotics. *Br J Nutr* 2002; 87 Suppl 2: S145-51.
- Tuohy KM, Kolida S, Lustenberger AM, Gibson GR. The prebiotic effects of biscuits containing partially hydrolysed guar gum and fructo-oligosaccharides – a human volunteer study. *Br J Nutr* 2001; 86: 341-8.
- Moore N, Chao C, Yang LP, Storm H, Oliva-Hemker M, Saavedra JM. Effects of fructo-oligosaccharide-supplemented infant cereal: a double-blind, randomized trial. *Br J Nutr* 2003; 90: 581-7.

ACKNOWLEDGEMENTS

We thank L. Contini MD for the statistical analysis. The study was supported by Dalco srl, Mirano-Venice, Italy (mail@midalgroup.com).

Correspondence to:

Prof. GIUSEPPE DODI
Department of Surgery, Clinica Chirurgica 2
University of Padova, Italy
giuseppe.dodi@unipd.it

The assessment of normal female urethral vascularity with Color Doppler endovaginal ultrasonography: preliminary report

ANDRZEJ PAWEŁ WIECZOREK⁽¹⁾ - MAGDALENA MARIA WOZNIAK⁽¹⁾
 ALEKSANDRA STANKIEWICZ⁽¹⁾ - MICHAŁ BOGUSIEWICZ⁽²⁾ - GIULIO ANIELLO SANTORO⁽³⁾
 TOMASZ RECHBERGER⁽²⁾ - JAKOB SCHOLBACH⁽⁴⁾

(1) Department of Pediatric Radiology, Children's Hospital, Skubiszewski Medical University of Lublin, ul. Chodźki 2, Lublin, Poland

(2) 2nd Department of Gynecology, Skubiszewski Medical University of Lublin, ul. Jacewskiego 8, Lublin, Poland

(3) 3rd Division of Surgery, Pelvic Floor Unit, Regional Hospital, Treviso, Italy

(4) Chameleon Software, Kunzenweg 2b, Freiburg, Germany

Abstract: In this study we compared vascular intensity in female urethra in its midsagittal plane at 3 predefined parts (intramural, midurethral and distal) and in its axial plane at the level of midurethra (rhabdosphincter vs. the inner part of urethra) in premenopausal, nulliparous, continent patients. Eighteen nulliparous patients, mean age 32.67 years (range 18-53 years) with no pelvic floor disorders and no history of incontinence were enrolled in the study. In the first part of their menstrual cycle, the subjects underwent endovaginal ultrasound with the use of a biplane, high frequency (5-12 MHz) transducer. Vascular pattern of the urethra was obtained in color-doppler mode using both, the linear and transverse arrays of the transducer and the data were registered as video files in a stable position of the probe. For each patient two video acquisitions were taken, one in midsagittal plane, second in axial plane at the level of midurethra. For the quantitative assessment of the blood flow, a PixelFlux software was applied. The comparison of intensity among three levels of vascularity observed in sagittal section as well as the comparison of vascular intensity between outer (rhabdosphincter) and inner (circular smooth muscle, longitudinal smooth muscle and submucosa) rings of the urethra were performed. The results of the analysis show that the midurethra has got the largest intensity of vascularity, which is statistically significantly better than the latter part of urethra (intramural and distal parts). Statistical analysis showed the differences of vascular intensity between intramural part of urethra and midurethra (0.47, $p < 0.05$) and between midurethra and distal urethra (0.43, $p < 0.05$). No statistically significant differences were found between the vascular intensity of in outer and inner part of the midurethra; but on contrary the values were very similar (0.76, $p < 0.05$). High frequency transvaginal ultrasound with the use of Color Doppler mode is a very reliable method enabling visualization of urethral vessels distribution. The data obtained from the scans may be further analyzed with the use of dedicated software in order to define the intensity of urethral vascularity and different anatomical areas, which are responsible for various functionalities.

Key words: Urethral vascularization; Color-doppler; Endovaginal ultrasound.

INTRODUCTION

The female urethra has very complex anatomy and function which are still not fully understood.¹ Vascularity is one of the major factors contributing to maintaining the normal function of urethra. The usefulness of color-doppler as well as of spectral analysis of blood flow within the urethral vessels have been already described in the literature.²⁻⁴ From these reports it is known that a number of various elements, such as age, parity, body mass index, estrogen/gestagen profile, menopause, hormone replacement therapy can influence the appearance of Doppler flow spectrum in urethral vessels. However, the research describing the number and the distribution of urethral blood vessels is scarce. It is known from anatomy that the female urethra is supplied by 3 different vessel networks manifested by 3 major vascular levels – proximal (intramural), middle (midurethra) and distal. The aim of the study was a comparison of intensity of the vascularity of urethra at 3 levels in its sagittal plane (intramural, midurethra and distal part), and in its axial plane at the level of midurethra (rhabdosphincter vs. the inner part of urethra) in premenopausal, nulliparous, continent patients.

MATERIAL AND METHODS

Eighteen nulliparous patients, mean age 32.67 years (range 18-53 years), consecutively referred for gynecologic ultrasound due to symptoms other than SUI, voiding dysfunction, POP, cystocele or entero/rectocele were recruited from 2nd Department of Gynecology of the Skubiszewski Medical University of Lublin. All the women gave written informed consent and underwent endovaginal ultrasound using a biplane transducer (type 8848, B-K Medical, Herlev, Denmark) 21 mm in diameter, frequency range from 5 to 12 MHz. The patients were scanned in the first part of their menstrual cycle. Ultrasound scanning was performed at rest in the supine position. Longitudinal images of the bladder neck and urethra were

displayed using the 12 MHz linear array of the transducer positioned towards the symphysis pubis (SP). The transducer was placed in the vagina in the neutral position. The position of the transducer was assumed as symmetrical when the lumen of the urethra was visualized along the entire length of the urethra, from the bladder neck to external meatus of urethra.

The vascular pattern of the urethra was obtained in color-doppler mode using both the linear and transverse arrays of the transducer and the data were registered as video files in a stable position of the probe (Fig. 1 *a, b*). For each patient, two video acquisitions were taken: one in the sagittal plane at the level of urethral lumen, and the second in the axial plane at the level of midurethra. For the quantitative assessment of the blood flow, the Pixel Flux software (Chameleon Software, Freiburg, Germany) was applied. With the use of PixelFlux software, the vascular pattern was analyzed within manually defined regions of interest (ROI). At first, the video files in the sagittal plane were used for the analysis. Regions of interest were set at sequence at 3 levels (intramural, midurethra and distal urethra) (Fig. 2 *a, b, c*) for each patient. Subsequently, video files recorded in the axial plane at the level of midurethra were studied. Two regions of interest were defined for each patient – one comprising the rhabdosphincter (the outer ring of urethra), and the second comprising the circular smooth muscle, the longitudinal smooth muscle and the submucosa (the inner ring of the urethra) (Fig. 3 *a, b*). The intensity of vascularity defined as the ratio between the area of the vessels detected in Color Doppler and the area of ROI was calculated for each patient for all 3 regions of interests in sagittal plane and 2 regions in axial plane. Two measurements of the intensity were performed for all patients:

1. A comparison of intensity among three levels of vascularity based on the data obtained from files recorded in sagittal section.
2. A comparison of intensity between two rings of vascularity (the outer ring and the inner ring of the urethra) based on the data obtained from files recorded in axial section.

The descriptive statistics (SPSS 14.0 PL for Windows) for continuous data was performed. The results were given as mean values with standard deviation (SD). The Kolmogorov-Smirnov test (KS-test) was used to define the distribution of data. Subsequently, the relationships

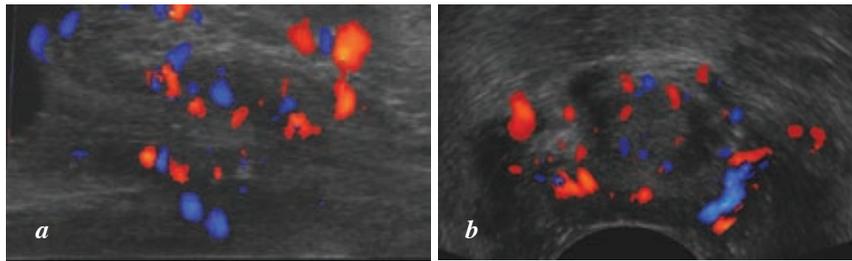


Fig. 1. *a, b.* – Vascular pattern of the urethra obtained in color-doppler mode using the linear transverse array of the transducer.

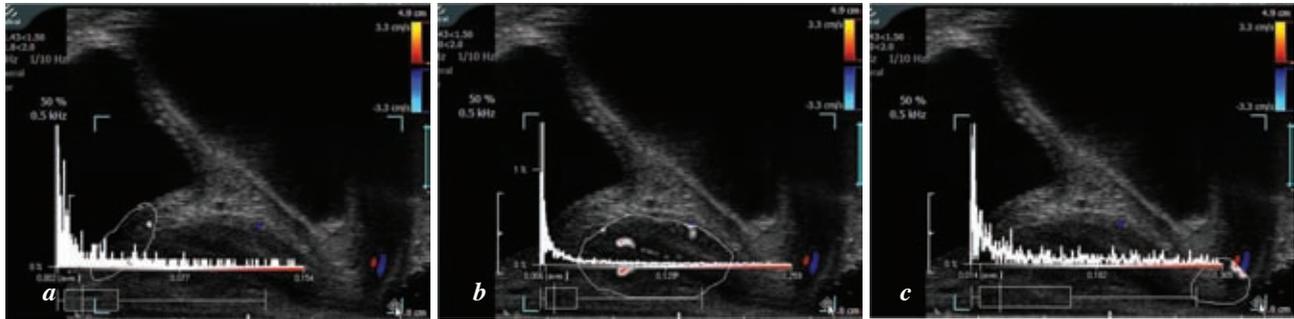


Fig. 2. – *a)* Analysis of intensity of urethral vascularity with the use of PixelFlux software. Region of interest set at the level of intramural part of urethra. Sagittal plane; *b)* Analysis of intensity of urethral vascularity with the use of PixelFlux software. Region of interest set at the level of midurethra. Sagittal plane; *c)* Analysis of intensity of urethral vascularity with the use of PixelFlux software. Region of interest set at the level of distal part of urethra. Sagittal plane.

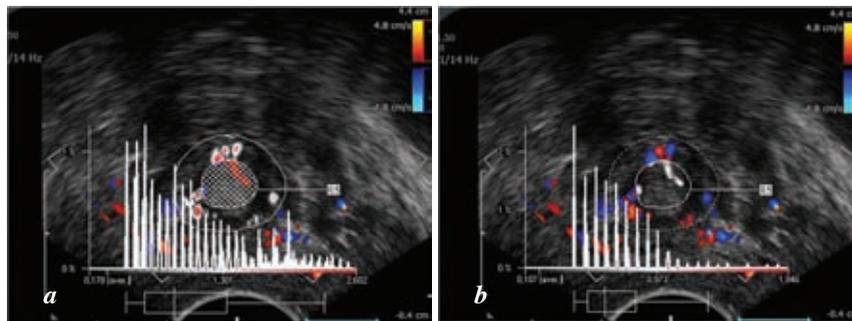


Fig. 3. – *a)* Analysis of intensity of urethral vascularity with the use of PixelFlux software. Region of interest set at the outer ring of urethra (rhabdosphincter). Axial plane; *b)* Analysis of intensity of urethral vascularity with the use of PixelFlux software. Region of interest set at the inner ring of urethra (circular smooth muscle, longitudinal smooth muscle and submucosa). Axial plane.

among different variables were assessed with T test for dependent samples. $P < 0.05$ was considered as statistically significant.

RESULTS

Statistical differences of intensity of vascularity were observed between intramural part of urethra and midurethra and also between midurethra and distal urethra. The results of the analysis show that the midurethra, which is the part of urethra comprising rhabdosphincter muscle, has got the largest intensity of vascularity, which is statistically significantly better than the latter part of urethra (intramural and distal parts). While performing the analysis of the urethra in its axial section at the level of midurethra, the authors did not find any statistically significant differences in the intensity of vascularity in vessel distribution between the outer ring of the urethra (rhabdosphincter) and the inner ring of the urethra (circular smooth muscle, longitudinal smooth muscle and submucosa). On the contrary, the intensity of vascularity in both anatomical areas was very similar ($0.76, p < 0.05$).

DISCUSSION

Up till now no reliable diagnostic tool existed that would enable a quantitative analysis of urethral vascularization.

Different authors assessed urethral vascularity with the use of color and spectral doppler techniques.²⁻⁶ However, the appearance of the Doppler flow spectrum can be impaired by number of factors, among which the sexual hormones profile is the most important one.⁷ Besides, spectral Doppler studies are generally time consuming and relatively difficult to perform from the technical point of view, particularly for the vessels of a very small diameter, such as found in the urethra. Moreover, this kind of examination is usually performed from the transperineal approach, where the urethra is prone to be pressed by the transducer, which results in artificial increasing of resistance index (RI) giving false results. Additionally, moving artifacts, breathing artifacts, the difficulty in obtaining proper insonation angle, as well as placing the gate properly in a little vessel greatly limit the usefulness of spectral Doppler studies in the assessment of urethral vascularity.

Because of these limitations, it is important to find an easy method which would allow assessment of the number of vessels and their distribution. According to Ashton-Miller, the lumen of the urethra is surrounded by a prominent vascular plexus that is believed to contribute to the continence by forming a watertight seal via coaptation of the mucosal surfaces.⁶ Basing on this theory, the authors believe that the distribution of vessels, their number and localization, as well as

TABLE 1. – The intensity of vascularity (the ratio between the area of the vessels detected in color-doppler and the area of ROI) at 3 vascular levels - intramural, midurethra and distal urethra based on the data obtained from files recorded in sagittal section.

Intensity	Number of patients	Minimum	Maximum	Mean	Standard deviation (SD)
Intramural urethra	18	0.000	0.040	0.00689	0.009863
Midurethra	18	0.001	0.077	0.01433	0.017617
Distal urethra	18	0.000	0.017	0.00528	0.004921

TABLE 2. – Intensity of vascularity (the ratio between the area of the vessels detected in color-doppler and the area of ROI) at 2 urethral rings (the outer ring and the inner ring of the urethra) based on the data obtained from files recorded in axial section at the level of midurethra.

Intensity	Number of patients	Minimum	Maximum	Mean	Standard deviation (SD)
Outer ring	18	0.004	0.131	0.02906	0.029345
Inner ring	18	0.001	0.125	0.03244	0.042521

TABLE 3. – Statistical analysis for the significance of the differences in intensity of vascularity among three levels (intramural, midurethra and distal urethra) in sagittal section and two rings (the outer ring and the inner ring of urethra) in axial section.

Pair	Statistical significance (p<0.05)
Intramural urethra - Midurethra	0.47
Intramural urethra - Distal urethra	0.57
Midurethra - Distal urethra	0.43
Outer ring – Inner ring	0.76

the regions supplied by them, seem to play a very important role. Thus, in order to acknowledge the normal vascularity of the urethra, the study including premenopausal, nulliparous, continent patients was performed. The authors believe that, together with the urethral dysfunctions and morphological disturbances, particularly urinary incontinence and pelvic organ prolapse, a change in urethral vascularity may occur, possibly prior to the appearance of clinical signs.⁸⁻¹⁰ In such a situation the assessment of urethra vascularization could become a predictive value which would give the opportunity to implement the prophylaxis or early treatment for the patients, before the symptoms become severe. The technique used in the study appeared very useful in the assessment of the vascular pattern of the urethra, being at the same time easy and fast to perform, with the results obtained as an absolute value. The literature review does not contain much information about urethral vascularity. Siracusano et al.¹¹ performed transperineal ultrasound after intravenous application of ultrasound contrast media in order to enhance Doppler signals from the urethral vessels. The method, although it might give information about the vessels in the urethral complex, is invasive and relatively expensive. The transperineal access with a large array of the transducer, too deep a focus, and a large distance to the urethra, also greatly limit the reliability of the method. In another study, the same author⁽²⁾ assessed urethral vascularization in healthy young women using Color Doppler and spectral Doppler scans, defining resistance index (RI) in urethral vessels at three parts of urethra (proximal, middle and distal). This study was also performed from the transperineal access. In the current study, the authors applied a transvaginal high frequency ultrasound which, due to almost direct contact of the urethra to the transducer and owing to the focus transverse point placed on the right depth, creates the opportunity of precise evaluation of the assessment of urethral vascularity. High frequency 5-12 MHz biplane transducer, with perpendicular and transverse ultrasound beam formation appeared to be a very reliable diagnostic tool in the assessment of ure-

thra vascularity. The results showed that the midurethra is the most vascularized part of the urethra, with the latter parts (intramural and distal) having less blood supply, comparable to each other. While Siracusano's study⁶ depicted similar spectrum of blood flow within midurethra and distal urethra, with increased RI in proximal (intramural) part. In conclusion, high frequency transvaginal ultrasound with the use of Color Doppler mode is a very reliable method enabling visualization of urethral vessels distribution. The data obtained from the scans may be further analyzed with the use of dedicated software in order to define the intensity of urethral vascularity and different anatomical areas, which are responsible for various functionalities.

REFERENCES

1. De Lancey JOL, Ashton-Miller JA. Pathophysiology of Adult Urinary Incontinence. *Gastroenterology* 2004; 126: S23-S32.
2. Siracusano S, Bertolotto M, D'Aloia G. et al. Colour Doppler ultrasonography of female urethral vascularization in normal young volunteers: a preliminary report. *BJU International* 2001; 88, 378-38.
3. Yang JM, Yang SH, Huang WC. Functional correlates of Doppler flow study of the female urethral vasculature. *Ultrasound Obstet Gynecol* 2006; 28: 96-102.
4. Kobata SA, Girão MJ, Baracat EC et al. Estrogen therapy influence on periurethral vessels in postmenopausal incontinent women using Doppler velocimetry analysis. *Maturitas* 2008; 20: 43-7.
5. Jackson SR, Brookes S, Abrams P. Measuring urethral blood flow using Doppler ultrasonography. *BJU Int* 2000; 86: 910 (15-17).
6. Siracusano S, Bertolotto M, Silvestre G, et al. The feasibility of urethral color ultrasound imaging in the diagnosis of female intrinsic sphincter deficiency: preliminary results. *Spinal Cord* 2002; 40: 192-5.
7. Miodrag A, Castleden CE, Vallance TR. Sex hormones and the female urinary tract. *Drugs* 1988; 36: 491.
8. Ashton-Miller JA, DeLancey JO. Functional anatomy of the female pelvic floor. *Ann N Y Acad Sci* 2007; 1101: 266-96.
9. Rud T, Anderson KE, Asmussen M. et al. Factors maintaining the intraurethral pressure in women. *Invest Urol* 1980; 17: 343.
10. Sorensen S. Urethral pressure variations in healthy and incontinent women: doctoral thesis. *Neurourol Urodyn* 1992; 141: 817-20.
11. Siracusano S, Bertolotto M, Cucchi A, et al. Application of ultrasound contrast agents for the characterization of female urethral vascularization in healthy pre- and postmenopausal volunteers: preliminary report. *Eur Urol*, 2006;50:1316-22

Correspondence to:
WIECZOREK PAWEL
E-mail: wieczornyp@interia.pl