

Use of anal sling in the treatment of faecal incontinence

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Abstract: Fecal incontinence is defined as the recurrent uncontrolled passage of faecal material for at least 1-month duration. It affects people of all age and especially middle-aged women, nursing home residents and elderly. The evaluation includes a detailed clinical assessment with an appropriate physiological exam and imaging tests of the anorectum to provide information regarding the etiology and the severity of the problem. Before considering surgery, medical treatment, such as diet correction, fibers, transit delay, little enemas and rehabilitation must have failed. Selecting patients is critical in surgical treatment. In carefully selected patients with severe incontinence and rectal prolapse, who have not had acceptable improvement in symptoms the transobturator anal sling can be considered an alternative among the options. Implants for surgical treatment is a therapeutic option derived from experience by urogynecologists. Bioreabsorbing materials placed (tension free) along puborectalis muscle's line support pelvic diaphragm creating an elastic structure. The specific type of net for these applications is made by the monofilament of Prolene®, manufactured by Ethicon Inc.®, and diffused under the trade name of Net Polypropylene PROLENE®. In our personal experience 12 patients underwent surgery between 2006 and 2009. Intervention is feasible in early and advanced phase of fecal incontinence and rectal or pelvic prolapse. Even if this procedure is invasive, can be considered relatively simple and effective. None of patients had complications in subsequent follow-up.

Key words: Anal sling; Fecal incontinence; Surgical treatment; Prosthetic mesh.

INTRODUCTION

Faecal incontinence is the involuntary loss of rectal contents through the anal canal. It is defined as the recurrent uncontrolled passage of faecal material for at least 1-month duration. The prevalence varies from 2 to 18% depending on the definition of incontinence. Female patients predominate in most reports, but epidemiological studies show a more equal gender distribution. Anal incontinence is an embarrassing and debilitating problem that affects people of all ages and especially middle-aged women, nursing home residents and the elderly.¹ It significantly affects the quality of life, causing such a social embarrassment that those who suffer from it are reluctant to go out due to fear of social contact and therefore frequently become housebound.²

The variations of this condition encompass a wide spectrum, from mild to severe.³ There are three subtypes: passive incontinence – the involuntary discharge of stool or gas without awareness; urge incontinence – the discharge of faecal matter in spite of active attempts to retain stool; and faecal soiling – the leakage of small amount of stool without awareness.⁴

The evaluation includes a detailed clinical assessment with an appropriate physiological exam and imaging tests of the anorectum to provide information regarding the etiology and the severity of the problem. There are several score indices to quantify symptoms for grading the severity of faecal incontinence and its impact on quality of life, such as the Fecal Incontinence Severity Index (FISI) and the Cleveland Clinic Incontinence Score (Wexner) that combines the loss of flatus, liquid, and solid stool, while the Fecal Incontinence Quality of Life Questionnaire (FIQL) and the SF-36 assess the quality of life.⁵ Specific tests that can define the underlying physiopathology include anorectal manometry and anal endosonography.⁶ These tools are used to assess the severity of symptoms and therefore are recommended to choose a strategy for treatment.

The treatment can be either medical or surgical. The first one consists in dietary changes, modification of fiber intake (either increase or decrease), bulking agents,^{7,8} and bowel-habit training. Anti-diarrheal medications, such as loperamide, diphenoxylate, amitriptyline and bile-acid binders can be tried with caution. Self-management with rectal irrigation to keep the rectum empty and thereby preventing fecal incontinence has been successful both in the short- and long term.⁹ Among non-invasive procedures both electrostimulation and biofeedback therapies are safe.¹⁰

Initially used for treatment of urinary incontinence, Sacral nerve stimulation has now become an established treatment for fecal incontinence.^{11,12}

If medical treatments failed, patients can undergo surgery. Selecting patients is critical in surgical treatment to restore the anal aperture by repairing sphincter defects. Established injuries in symptomatic patients are treated by overlapping sphincteroplasty, which is usually done without creating a diverting stoma. If none of the previous options are feasible, diverting stoma remains an excellent alternative. Otherwise, in selected cases (for example when traumatic or neurogenic injuries are extensive) dynamic graciloplasty or an artificial anal sphincter can be tried.^{13,14,15,16}

The purpose is to use a prosthetic mesh made of non-reabsorbable or partly reabsorbable that is applicable in a manner so-called "tension free", without that this mesh exerts a tensile force on the surrounding tissue, in contrast with the techniques of suspension already developed.

PERIOPERATIVE STEPS

In carefully selected patients with severe faecal incontinence and rectal prolapse, who have not had acceptable improvement in symptoms, the transobturator anal sling can be considered an alternative among the options.

Implants for surgical treatment is a therapeutic option derived from urogynecologists experience.^{17,18} A prosthesis

made of a partially reabsorbing nets used in the surgical treatment of prolapsed pelvic and faecal incontinence. It produces an increase in the production of connective tissue, creating a naturally elastic structure; this provides effective support and prevents the subsequent descent of the pelvic structures.

The technique consist in placing a bioreabsorbing or partially reabsorbing net along puborectalis muscle's line to support pelvic diaphragm creating an elastic structure that surrounds anorectal canal bilaterally in a tension free manner, that is without applying any traction of the surrounding tissues; it is suitable to be applied in correspondence of the obturator foramens (Figure 1, 2).

This Italian patent – not yet available on the market – includes the device and the “hammock” instruments to implant the prosthesis, which is formed by a central body of biological material and four ends in non-absorbing material



Figure 1. – Anatomy of the pelvis.

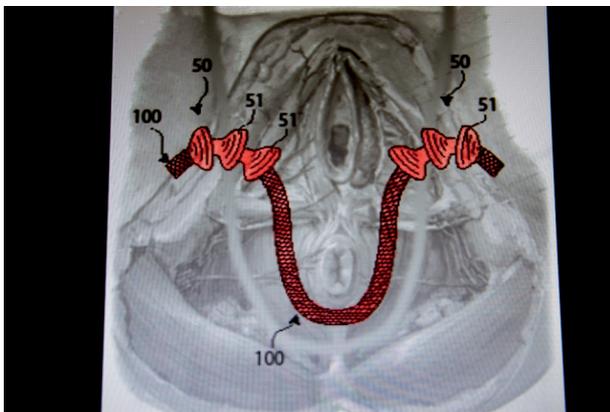


Figure 2. – Positioning of the prosthesis.



Figure 3. – Prosthetic mesh.

to “suspend” the rectum and reposition it in its anatomical position (Figure 3).

Even if this procedure is invasive, it can be considered relatively simple and effective. There were no serious complication nor was ever necessary to explant the prosthesis.

This article describes the surgical technique used for the implantation and presents our personal experience in 12 patients who underwent surgery between 2006 and 2009. Intervention is feasible in early and advanced phase of fecal incontinence and rectal or pelvic prolapse. Symptoms resolution or alleviation reaches up to 85% of cases in the immediate postoperative phase. The Wexner score is about 10 points lower at a 3-month follow-up, and is reduced to 8 points 1 year after treatment. Changes to the relief of anal rectal manometry is about 12 mmHg squeeze pressure and 15 mm Hg resting pressure to follow-up to 1 year.

TECHNIQUE

The procedure may be carried out either under general or spinal anaesthesia, with the patient placed in the lithotomic position.

After putting the patient in a lithotomic position and disinfecting perineum and anus-rectal (and vaginal) cavities (after a suitable intestinal preparation), a vertical incision is made about 2-3 cm long, and a lateral one beyond 3 cm from anal coetaneous folds, on the left side of the patient at 3 hour (or on the right side in case technician is left-handed) (Figure 4). Once unglued subcutaneous tissue by an acute and rounded way, a tunnel is made by digitoclasia about anus-rectal channel, thus entering into a virtual space between rectum rear wall and ano-coccygeusraphe (Figure 5).



Figure 4. – Perineal incision and landmarks for engraving at the obturator foramina.



Figure 5. – Tunnel realized through digitoclasia between the rear wall of the rectum and the ano-coccygeusraphe.



Figure 6. – Curved needle Hammock insertion through the obturator foramen coming out perineal incision.



Figure 7. – Leakage from the hammock loop to attach the prosthesis.



Figure 8. – Placement of prosthetic mesh in the loop.

Two point-shaped cutaneous incisions are made by lancet, at the level of the lower edge of obturator foramen, having as bilateral repere ischial tuberosities.

Afterwards, a curved needle is introduced, passing through obturator membrane, and thus it is brought by a combined action (through the vagina for a woman, through the rectum for a man) until exiting from the surgical opening already realized (Figure 6, 7).

It is hooked distal end of band exiting from skin (Figure 8, 9). This action is repeated from the opposed part, coupling needlepoint behind rectum wall (Figure 10).

Now, two arms of band are pulled by a combined action of hand index within anal channel in order to evaluate tension of central part of the same (Figure 11).



Figure 9. – Leakage by the skin of prosthetic mesh through the obturator foramen.

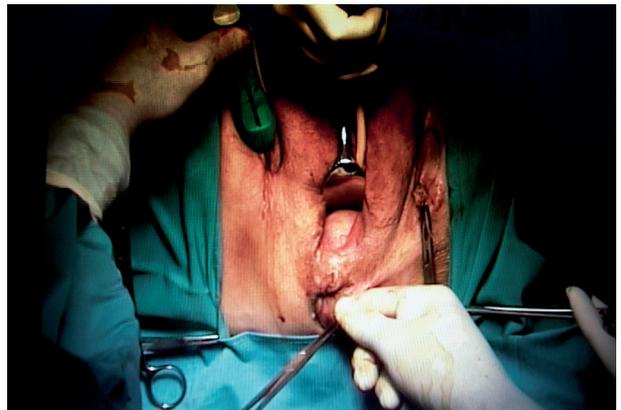


Figure 10. – Action repeated from the opposed part, coupling needlepoint behind rectum wall.



Figure 11. – Two arms of band are pulled to evaluate the traction of the central part of the prosthetic mesh behind the anal canal.

Now, it is considered the retraction condition of perineum in order to eventually loosening or pulling said band (Figure 12). Two band ends can be let free within subcutaneous tissue, thus exploiting the so-called Velcro effect of synthetic material, or they can be fixed by a quick hooking system, or anchored by two non-reabsorbing mono-filament suture stitches, or even self-support thanks to a silicone ogives or similar material system (Figure 13).

Cutaneous opening are closed after having cut the exceeding net.

DESCRIPTION OF THE PROSTHESIS

The main advantage of the prosthetic assembly of the



Figure 12. – Finding of prosthetic arms and repositioning of the anus in anatomic site.



Figure 13. – Final result and closing of the surgical accesses.

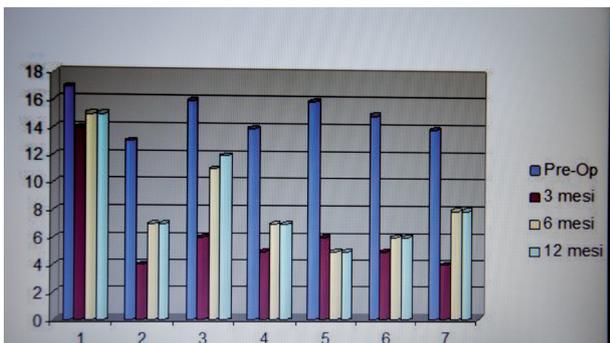


Figure 14. – Trend in the Wexner score at follow-up.

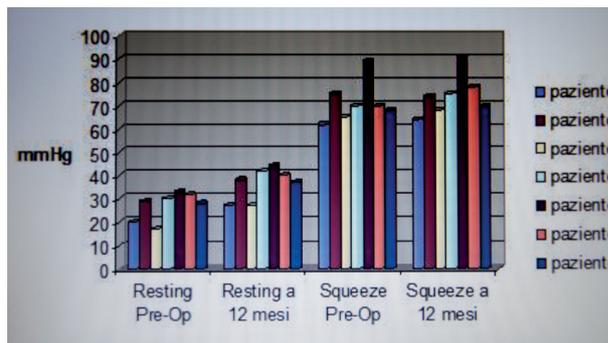


Figure 15. – Trend of anorectal manometry findings of squeeze pressure and resting pressure in the FU.

present intervention is an increase of production of connective tissue between surgically implanted net meshes, naturally creating a not-reabsorbing and elastic support which provides an efficient support and prevents a subsequent descent of pelvic structures subjected to prolapse. Furthermore, surgical application of said prosthetic assembly that can be carried out both in a premature or in an advanced phase of rectal prolapsed and in incontinence, correcting both of them.

The specific type of net for these applications is made by the monofilament of Prolene®, manufactured by Ethicon Inc.®, and distributed under the trade name of Net Polypropylene PROLENE®.

Said synthetic net, sterile and inert, has a bi-directional elasticity and a traction resistance higher than 10 kg/cm², with a thickness between 0.5 and 0.9 mm, preferably about 0.7 mm. Transverse dimensions of meshes are between 1 and 3 mm, meshes has rhomboid shape. Each wire is a not-reabsorbing monofilament wire comprised of polypropylene (C₃H₆)_n, particularly an isotactic stereoisomer of polypropylene.

CONCLUSION

Our experience on the twelve patients who underwent this procedure shows that the anal sling is a valid option among the existing ones for the treatment of some patients suffering from both fecal incontinence and rectal prolapse (Figure 14, 15).

The main advantages lie in the relative simplicity of the procedure and in its effectiveness.

None of the patients experienced subsequent complications, and none of them required an explants afterwards. Another set of patients has received the treatment, and the follow up results will be published when available.

CONFLICT OF INTEREST

The authors declare that have not receive any grants or financial support for the study and there is no conflict of interest.

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