



CONSERVATIVE TREATMENT FOR THORACIC DISC HERNIA

TORASİK DİSK HERNİLERİNDE KONSERVATİF TEDAVİ

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SUMMARY

Objective: To emphasize the importance of thoracic disc herniation, a rare cause in the differential diagnosis of chronic back pain.

Materials and Methods: A retrospective analysis was performed for the results of epicrisis and radiological examinations of 437 patients (206 males and 231 females; age range: 16–88 years; mean age: 47.98 ± 18.41 years) who suffered from chronic back pain and were admitted to our center between January 2010 and September 2013. 30 patients treated conservatively were included in this study (13 males and 17 females; mean age: 51.23 ± 17.19 years).

Results: T2–3, T3–4 and T4–5 disc herniations were observed only in female patients, while T1–2 disc herniation was not observed in any patients. 30% of all the thoracic herniations were T11–12 disc herniations, which were observed more in the female population (47.1%) than in the male population (7.7%), and this difference was statistically significant (p=0.042). When considering disc degeneration, grade 4 was the second most frequent degeneration after grade 3, with grade 4 degeneration observed in 58.8% of the female population and 15.4% of the male population, which was statistically significant (p=0.016).

Conclusion: Most thoracic disc herniations are asymptomatic. Conservative treatment is preferred, if there is no spinal cord compression in the natural course of the disease. However, surgical treatment is necessary for patients with neurological deficit or severe radicular pain.

Key Words: Thoracic disc hernia, conservative treatment, abdominal pain

ÖZET

Amaç: Kronik arka ağrısı çeken hastaların ayırıcı tanısında nadir görülen bir sebep olan torasik disk hernilerinin önemini vurgulamak.

Materyal ve Metod: Ocak 2010–Eylül 2013 arası polikliniğe sırt ağrısı şikayeti ile başvuran 206 erkek, 231 kadın ortalama 47.98 + 18.41 yaşında (16–88 yaş arası) toplam 437 hastanın epikriz ve radyolojik tetkiklerinin retrospektif olarak incelenmesinden elde edilen sonuçlar değerlendirildi. Cerrahi tedaviyi kabul etmeyen ve konservatif tedavi ile takip ve tedavisi düzenlenen 58 seviye torasik disk hernili 13 erkek, 17 kadın ortalama 51.23 + 17.19 yaşında 30 hasta çalışmaya dâhil edildi.

Sonuçlar: Çalışmaya dâhil olan hastaların hiçbirinde T1-2 disk hernisine rastlanmazken, T2-3, T3-4 ve T4-5 diskleri sadece kadın hastalarda görüldü. Tüm torasik disk hernilerinin % 30'unu oluşturan T11-12 disk hernilerinin kadın hastalardaki disk hernilerinin % 47.1'ini erkek hastalardaki disk hernilerinin %7.7'ini oluşturduğu görüldü, aradaki fark istatistiksel olarak anlamlı idi (p=0.042). Disk dejenerasyonu değerlendirildiğinde grade-3 dejenerasyondan sonra ikinci sıklıkla görülen grade 4 dejenerasyonu kadın hastalarda % 58.8, erkek hastalarda % 15.4 oranında olduğu görüldü, aradaki fark istatistiksel olarak anlamlı idi (p=0.016).

Tartışma: Torasik disk hernisi vakalarının çoğu asemptomatiktir. Eğer spinal kord kompresyonu yoksa hastalığın doğal sürecinde konservatif yönetim savunulur. Tedavi seçeneği konservatif olsa da ilerleyici nörolojik defisit gelişen veya ciddi radiküler ağrısı olan hastalarda cerrahi tedavi gerekmektedir.

Anahtar kelimeler: Torasik disk hernisi, konservatif tedavi, abdominal ağrı.

Kanıt Düzeyi: Retrospektif klinik çalışma, Düzey III

Level of evidence: Retrospective clinical study, level III

INTRODUCTION

One of the most common pathological situations that spinal surgeons encounter is a herniated nucleus pulposus. Among all disc hernias, it is estimated that 4–5% are located in the thoracic region^{12,18}. Arce and Dho stated that 75% of cases had hernia at a level lower than T8, 3% had hernia between T1 and T2 and less than 1% had hernia between T2 and T3. In addition to disc degeneration, trauma is also among the major causes, with more than 25% of patients having a history of trauma¹.

The thoracic vertebrae are relatively immobile due to important structural supports such as the sternum and rib cage. Although natural kyphosis is present, the paraspinal muscles contribute to movement reduction and limit dorsal disc and annulus bulging. The incidence of symptomatic thoracic disc hernias is less than 1%. Upper and middle thoracic disc hernias can cause deep chest pain, and this can be confused with cardiac pain. Middle and lower thoracic disc hernias can mimic renal colic or gastrointestinal pains. Uncommonly, this situation is an important problem that can result in incorrect diagnosis and severe morbidity^{7,12,13,18}. During the decision making process, a careful physical examination and suitable imaging methods are key in reaching a final diagnosis.

In this study, we aimed to emphasize an accurate clinical approach for thoracic disc hernias that are likely to be confused with other diseases in the differential diagnosis, and therefore have a risk of causing severe neurological and functional losses, and to present the radiological results of patients treated with a conservative method and followed up.

MATERIALS AND METHODS

Patient population and patient selection:

A retrospective analysis was performed for the results of epicrisis and radiological examinations of 437 patients (206 males and 231 females; age range: 16–88 years; mean age: 47.98 ± 18.41 years) who suffered from chronic back pain and were admitted to our center between January 2010 and

September 2013. For all patients, age and gender information were obtained and the presence of symptomatic thoracic disc hernia was investigated. Thirty patients who did not accept surgery and were treated conservatively and followed up were included in this study (13 males and 17 females; mean age: 51.23 ± 17.19 years). The ratio between these 30 patients and the patients admitted to the clinic was investigated.

Radiological evaluation:

In this study, T2-weighted axial MRI images directed to the disc and T1- and T2-weighted sagittal MRI images obtained by routine spinal MRI in a 1.5 Tesla MRI device were evaluated. In addition to morphological classification of the discs according to posterior factors (bulging, protrusion, extrusion), disc degeneration was also evaluated. In the evaluation of disc degeneration, the classification defined by Pfirrmann¹⁴ was used (Table-1). Morphological classification and degeneration classification were evaluated in T2-weighted axial and sagittal images by two different radiologists and the results were obtained with a consensus decision. The majority of the discs showed morphological changes without any change of signal intensity.

Data analyses:

Obtained statistical results are presented using the Fisher's Exact Test and the Pearson Chi-Square test.

RESULTS

T2–3, T3–4 and T4–5 disc herniations were observed in female patients only, while T1–2 disc herniation was not observed in any patient. 30% of all the thoracic herniations were T11–12 disc herniations, which were observed at a higher rate in the female population (47.1%) than in the male population (7.7%), and this difference was statistically significant ($p=0.042$). Overall, the most common disc hernias, in order, were T9–10, T7–8, T11–12, and T8–9 (Table-2).

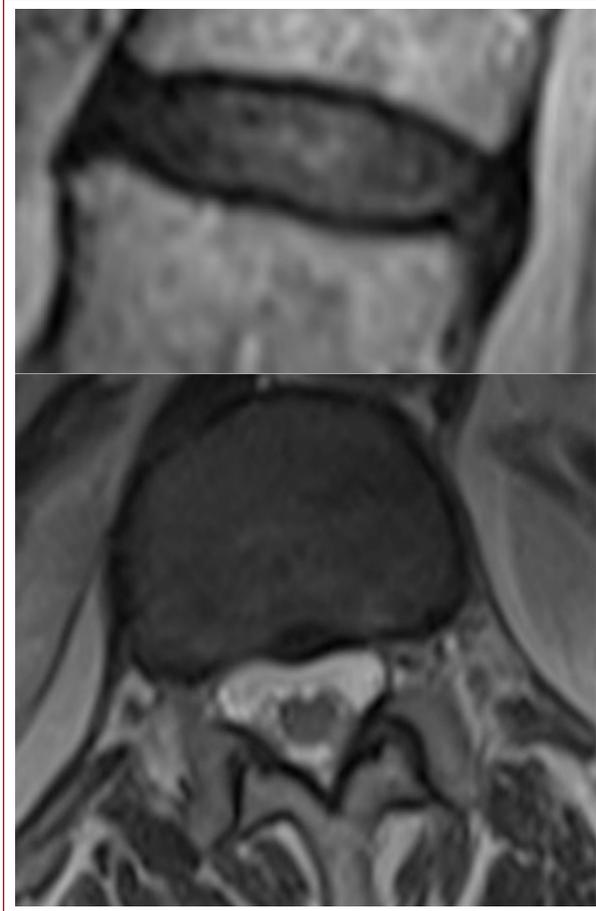


Figure-1.a) Grade 3 degeneration of T12–L1 disc of a 76-year-old female patient in a T2-weighted sagittal image, **b)** in axial image, focal minimal disc protrusion is seen with diffuse annular bulging at the same level.

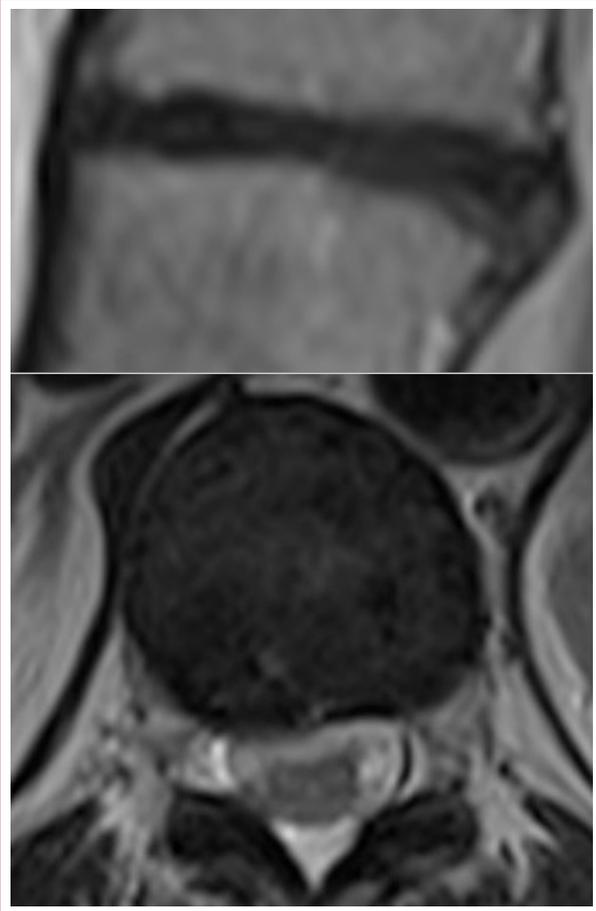


Figure-2.a) Grade 5 degeneration of T11–12 disc of a 53-year-old female patient in a T2-weighted sagittal image, **b)** in axial image, right paracentral zone- and broad-based minimal disc protrusion is seen at the same level.

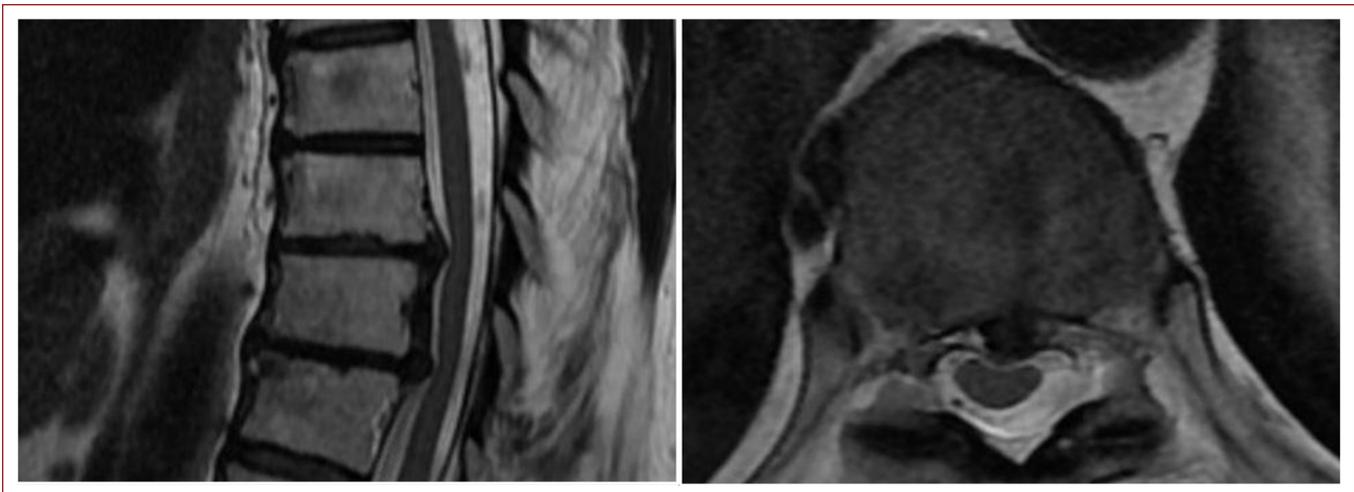


Figure-3. a) Grade 3 degeneration of T9–10 disc of 64-year-old female patient in T2-weighted sagittal image, Grade 4 degeneration of T10–11 disc, **b)** coalescing central caudal at T9–10 level in axial image, disc hernias extruded to central cranial at T10–11 level.

Table-1. The classification of intervertebral disc degeneration in MRI evaluation

Grade	Structure	Differentiation of NP and AF	Signal intensity*	Disc height
I	Homogenous, bright white	Yes	Hyperintense, isointense	Normal
II	Nonhomogeneous ± horizontal band	Yes	Hyperintense, isointense	Normal
III	Nonhomogeneous, gray	Undetermined	Intermediate intensity	Normal or slightly reduced
IV	Nonhomogeneous, gray-black	No	Intermediate intensity, hypointense	Normal or slightly reduced
V	Nonhomogeneous, black	No	Hypointense	Collapse

NP, nucleus pulposus; AF, annulus fibrosis

*Evaluated in T2-weighted sagittal images

Table-2. Gender distribution of the pathologies according to disc levels

Disc height	Disc pathology			p value
	Total patients (n=30) (n-%)	Female patients (n=17) (n-%)	Male patients (n=13) (n-%)	
T2-3	2 - 6.7%	2 - 11.8%	0 - 0%	1.000
T3-4	1 - 3.3%	1 - 5.9%	0 - 0%	1.000
T4-5	2 - 6.7%	2 - 11.8%	0 - 0%	1.000
T5-6	3 - 10.0%	2 - 11.8%	1 - 7.7%	1.000
T6-7	3 - 10.0%	2 - 11.8%	1 - 7.7%	1.000
T7-8	9 - 30.0%	5 - 29.4%	4 - 30.8%	1.000
T8-9	7 - 23.3%	5 - 29.4%	2 - 15.4%	0.427
T9-10	10 - 33.3%	7 - 41.2%	3 - 23.1%	0.440
T10-11	5 - 16.7%	4 - 23.5%	1 - 7.7%	0.355
T11-12	9 - 30.0%	8 - 47.1%	1 - 7.7%	0.042
T12-L1	7 - 23.3%	4 - 23.5%	3 - 23.1%	1.000

While considering disc degeneration, grade 4 was the second most frequent degeneration after grade 3, and grade 4 was observed in 58.8% of female patients and 15.4% of male patients, a difference

which was statistically significant ($p=0.016$). 46.2% grade 3 degeneration was observed in male patients. The least common degenerations in all patients were grade 1 and grade 5 (Table-3).

Table-3. The gender distribution of the pathologies according to disc degeneration

Degeneration	Disc pathologies			p value
	Total patient (n=30) (n-%)	Female patient (n=17) (n-%)	Male patient (n=13) (n-%)	
Grade 1	1 - 3.3%	0 - 0%	1 - 7.7%	0.433
Grade 2	6 - 20.0%	2 - 11.8%	4 - 30.8%	0.360
Grade 3	13 - 43.3%	7 - 41.2%	6 - 46.2%	1.000
Grade 4	12 - 40.0%	10 - 58.8%	2 - 15.4%	0.016
Grade 5	4 - 13.3%	3 - 17.6%	1 - 7.7%	0.613

There were no neurological deficits in any patients with thoracic disc hernia in our study, and they were treated with anti-inflammatory drugs and physiotherapy. If there was no response to treatment, short-term corticosteroid treatment was applied. Lastly, if symptoms continued, the patients were treated with gabapentin. For the patients with painful nerve endings, local anesthetic patches were used. Clinical complaints significantly reduced in all patients and there was no need for surgery in any patient.

DISCUSSION

Thoracic disc herniation is a rare pathology, as the thoracic vertebrae are relatively immobile compared to the rib cage¹⁶, and it is mostly asymptomatic^{4,9,21}. Thoracic vertebral pain is observed less than cervical or lumbar vertebral pain, and causes similar complaints. Therefore, thoracic disc herniation is ignored as a source of back or leg pain. Herniated thoracic intervertebral discs can mimic numerous medical conditions depending on the degree of involvement and the severity of the herniation¹⁶, and they are misdiagnosed as cardiac, abdominal, gastrointestinal, neoplastic, and demyelinating pathologies and many other diseases^{11,12,17,20,25}. Due to these conditions causing difficulties in diagnosis, imaging methods with some symptoms and clinical signs supporting diagnosis have been used, and the method used today for diagnosis is MRI^{3,8,13,15,24}. Leveling back pain has been generally reported with myelopathy in various degrees and sensation loss^{1,6,12,18,23}. Due to a narrow thoracic spinal canal, herniation can result in myelopathy in many cases. If there is no spinal cord compression, conservative methods are suggested for the natural process of the disease. The symptoms of spinal cord compression related to posterior disc protrusion are rare, but important. Although treatment options are conservative, surgical treatment is suggested in patients with progressive neurological deficit or severe radicular pain²¹.

In our study, patients were treated with anti-inflammatory drugs and physiotherapy. If there was no response to treatment, short-term

corticosteroid treatment was applied. Lastly, if symptoms continued, the patients were treated with gabapentin. For the patients with painful nerve endings, local anesthetic patches were used. Clinical complaints significantly reduced in all patients, and there was no need for surgery of any patients.

Unlike lumbar disc hernias, thoracic disc hernias are often calcified and they can penetrate the ventral dura¹⁹. Symptoms and signs can vary from back pain to paraplegia, and this condition is easily misdiagnosed due to its rarity¹⁰.

In our patients we detected belt-style pain, increase in pain while bending forward, and numbness and pain in the lower extremity, palpation and sensitivity in the thoracic region and no motor loss.

When considering that thoracic disc herniations are rare pathologies, surgical treatment is also rare. It represents 0.15–4% of all disc surgeries². Severe or progressive myelopathy is an absolute indication for surgery. There are many surgical methods, but the most suitable method is still controversial. Some surgical methods for thoracic disc hernias include an anterolateral approach (transthoracic, video-based thoracoscopic, retropleural thoracotomy), a posterolateral approach (transfacet pedicle protector and transpedicular), and a lateral approach (lateral extracavitary, parascapular, costotransversectomy)²². Anterolateral and lateral approaches can require thoracotomy for wide muscle dissection and a sufficient angle of view²².

The complexity of surgical treatment of thoracic disc hernias has been well defined by Eichholz et al.⁵. An inconsistency between the small ratio of patients and the many surgical methods developed results in spine surgeons encountering difficulties in treatment of the disease. The treatment options vary according to the severity of symptoms. Patients with insistent distressing pain or myelopathy signs are managed with the best surgical treatment. In patients with thoracic disc hernia, surgical treatment involves a significant paraplegia risk. Therefore, it is only indicated for patients with severe pain and neurological deficit. Radiological evaluation should

include MRI or tomography with or without myelography. Patients with isolated radicular pain or back pain can be successfully treated with non-surgical methods⁵.

As a result, many thoracic disc hernia cases are asymptomatic. If there is no spinal cord compression, conservative methods are suggested in the natural process of the disease. However, surgical treatment is suggested for patients with progressive neurological deficit or severe radicular pain. Herniated thoracic intervertebral discs can mimic numerous medical conditions depending on the degree of involvement and the severity of herniation¹⁶, and they can be misdiagnosed as cardiac, abdominal, gastrointestinal, neoplastic, or demyelinating pathologies, and many other diseases. This study is important as it emphasizes that physicians should consider thoracic disc hernia at differential diagnosis for diagnosis and management of this disease.

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