

SPONTANA RESORPCIJA VELIKE TORAKALNE DISKUS HERNIJE: PRIKAZ SLUČAJA

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CASE REPORT

SPONTANEOUS RESORPTION OF LARGE THORACIC DISC HERNIATION: A CASE REPORT

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SAŽETAK

Uvod: Hernijacija torakalnog diska je retko stanje, koje čini 0,1 – 3,0% svih diskus hernija, a koje može zahtevati kompleksno hirurško lečenje.

Prikaz slučaja: Prikazujemo četrdesetogodišnju pacijentkinju sa diskus hernijom na nivou Th9-Th10, koja je pokazala kliničko i radiološko poboljšanje nakon konzervativnog lečenja.

Zaključak: Naš prikaz slučaja pokazuje da, kod pacijenata sa torakalnom diskus hernijom, bez mijelopatije i sa blagim tegobama, operaciju treba maksimalno odložiti zbog mogućnosti spontane resorpcije diskus hernije.

Ključne reči: torakalna diskus hernija, spontana resorpcija

ABSTRACT

Introduction: Thoracic disc herniation is a rare condition, accounting for 0.1 – 3.0% of all disc herniations, and may require complex surgical treatment.

Case Report: We are presenting a 40-year-old patient with Th9-Th10 level disc herniation, who showed clinical and radiological improvement after conservative treatment.

Conclusion: Our case demonstrates that, in patients with thoracic disc herniation, without myelopathy and with mild complaints, surgery should be delayed as much as possible due to the possibility of spontaneous herniated disc resorption.

Keywords: thoracic disc herniation, spontaneous resorption

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UVOD

Hernijacija torakalnog diska je retko stanje, koje čini 0,1 - 3,0% svih diskus hernija, a koje može zahtevati kompleksno hirurško lečenje [1,2]. Procenjuje se da je incidencija simptomatske hernijacije torakalnog diska između 1 na 1.000 i 1 na 1.000.000 slučajeva godišnje. Oko 75% svih hernijacija torakalnog diska se javlja ispod nivoa Th8, pri čemu je najčešći nivo javljanja Th11–Th12, usled većeg stepena mobilnosti kičme i slabosti zadnjeg longitudinalnog ligamenta. Spontanu regresiju uklještenog diska je prvi put opisao Key 1945. godine, najčešće u lumbalnoj regiji, sa samo nekoliko opisanih slučajeva spontane regresije torakalnog diska [1-3].

Ovde prikazujemo slučaj pacijentkinje koja se javila sa uklještenjem diska na nivou Th9–Th10, a koja je i klinički i radiološki pokazala zavidno poboljšanje nakon primene samo konzervativne terapije.

PRIKAZ SLUČAJA

Četrdesetogodišnja pacijentkinja pregledana je u jednoj zdravstvenoj instituciji, žaleći se na bol na desnoj strani grudnog koša, teškoće pri disanju (pri udahu) i na osećaj težine u donjim ekstremitetima (izraženiji u desnoj nozi), što je trajalo već nekoliko meseci. Neurološki pregled je pokazao paravertebralni mišićni spazam u torakalnoj regiji, odsustvo motorne slabosti u donjim ekstremitetima, kao i odsustvo disfunkcije sfinktera. Lazarevićev znak je bio obostrano negativan. Nije utvrđeno prisustvo patoloških refleksa ni senzornih deficita.

Obavljeno je snimanje cervikalne, torakalne i lumbalne regije magnetnom rezonancom (MR). Uočena je velika hernijacija Th9–Th10 diska u desnoj dorzomedijalnoj regiji, uz pritisak na Th9 nervni koren i na prednji

INTRODUCTION

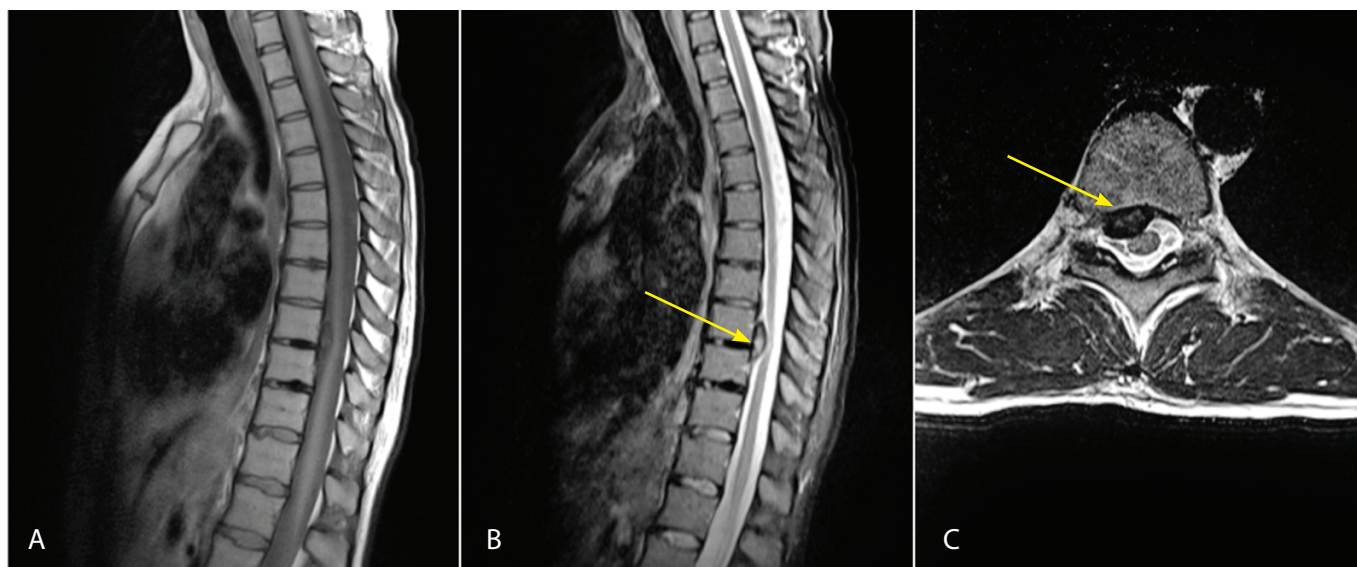
Thoracic disc herniation is a rare condition, accounting for 0.1 – 3.0% of all disc herniations, and may demand complex surgical treatment [1,2]. The incidence of symptomatic thoracic disc herniation is estimated to be between 1 in 1,000 and 1 in 1,000,000 per year. Approximately 75% of all thoracic disc herniations are found below the level of Th8, with Th11–Th12 being the most common level, due to the higher amount of spinal mobility and weakness of the posterior longitudinal ligament. Spontaneous regression of the herniated disc was first described in 1945 by Key, most commonly involving the lumbar region with only a few cases of described spontaneous thoracic disc regression [1-3].

We report the case of a patient presenting with Th9–Th10 level disc herniation, who showed impressive clinical and radiological improvement after conservative treatment only.

CASE REPORT

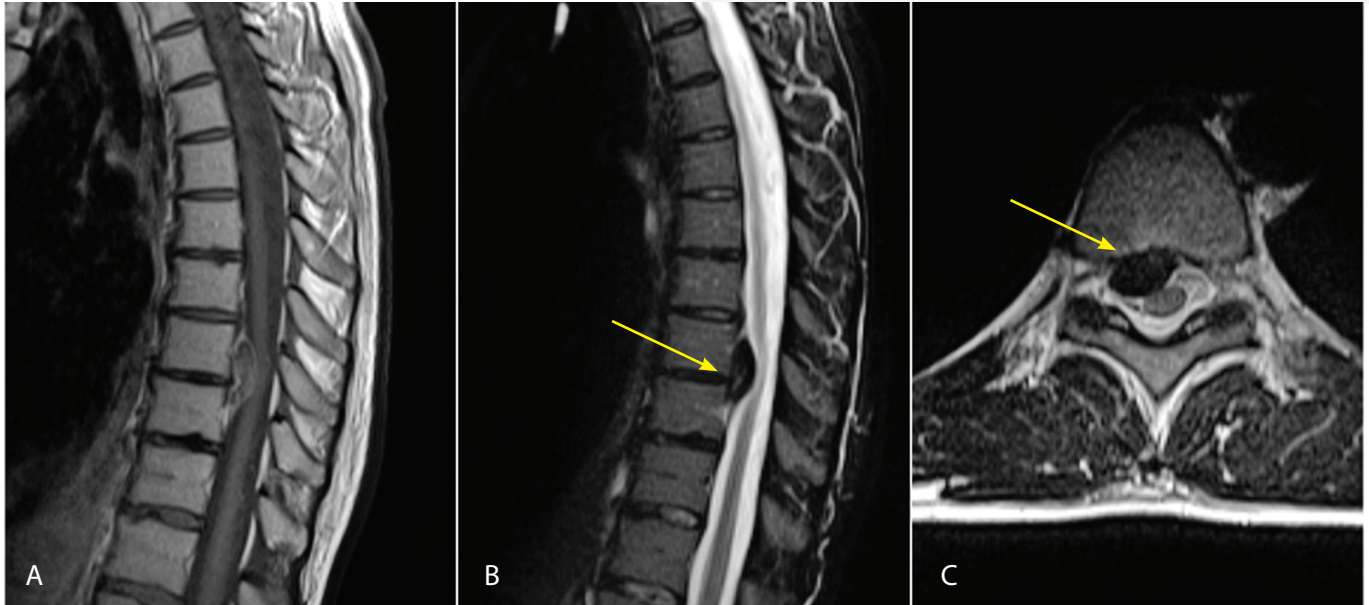
A 40-year old woman was examined in a different health care institution, complaining of pain in the right side of the thorax, difficulty breathing (during inhalation), and a feeling of heaviness in the lower extremities (more pronounced in the right leg), which had been ongoing for several months. A neurological exam showed paravertebral muscle spasm in the thoracic region, no motor weakness of the lower extremities, and absence of sphincter dysfunction. Lazarević's sign was bilaterally negative. Pathological reflexes and sensory deficits were not present.

Magnetic resonance imaging (MRI) of the cervical, thoracic, and lumbar regions was performed. A large



Slika 1. T1W sagitalna (A), T2W sagitalna (B) i T2W aksijalna ravan (C), jul 2017.

Figure 1. T1W sagittal (A), T2W sagittal (B) and T2W axial plane (C), July 2017.



Slika 2. T1W sagitalna (A), T2W sagitalna (B) i T2W aksijalna ravan (C), septembar 2017.

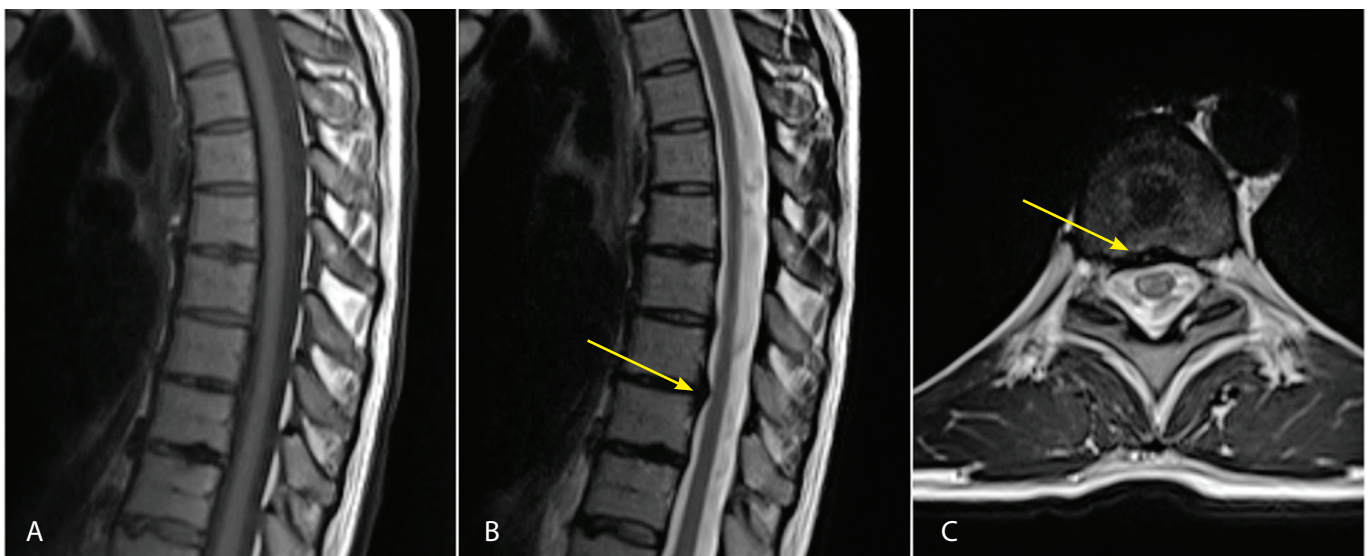
Figure 2. T1W sagittal (A), T2W sagittal (B) and T2W axial plane (C), September 2017.

deo kičmene moždine, bez mijelopatije (Slika 1). Predložena je operacija za koju pacijentkinja nije bila motivirana, te je stoga sprovedena fizikalna terapija.

Nakon dva meseca, obavljena je kontrola magnetnom rezonancom, koja je pokazala nepromenjenu leziju, ali je utvrđeno poboljšanje kliničkih simptoma (Slika 2). Nakon još jednog pregleda u gore navedenoj zdravstvenoj instituciji, još jednom je predložena operacija, uz diferencijalnu dijagnozu švanoma, koja je ustanovljena nakon postkontrastnog rubnog pojačanja. Pacijentkinja je tada upućena u našu instituciju. Nakon ponovljenog NMR pregleda, ustanovili smo da lezija ima karakterističan izgled hernijacije diska, a

Th9–Th10 disc herniation in the right dorsomedial region was observed, with compression of the Th9 spinal root and the anterior part of the spinal cord, without myelopathy (Figure 1). Surgery was suggested, but the patient declined. Therefore, physical therapy was performed.

A follow-up MRI was performed after two months, showing the unaltered lesion, but the clinical symptoms had improved (Figure 2). After another examination at the aforementioned institution, surgery was suggested once more, with a differential diagnosis of schwannoma established after post-contrast rim enhancement. The patient was then referred to our institution. Following an MRI re-examination, we found that the lesion had the



Slika 3. T1W sagitalna (A), T2W sagitalna (B) i T2W aksijalna ravan (C), april 2018.

Figure 3. T1W sagittal (A), T2W sagittal (B) and T2W axial plane (C), April 2018.

pošto su tegobe bile minimalne i već u poboljšanju, predložili smo nehirurško konzervativno lečenje, uključujući, za početak, i mirovanje u krevetu od nekoliko dana, praćeno fizikalnom terapijom. Kontrolni MR pregled torakalne kičme, obavljen devet meseci nakon prvog pregleda, pokazao je značajnu resorpciju diska (Slika 3). Ukupno praćenje pacijentkinje je trajalo 24 meseca, tokom kojih nije došlo ni do kakve komplikacije niti neurološkog pogoršanja.

DISKUSIJA

Većina hernijacija diska u torakalnoj regiji je asimptomatska. Klinička slika varira u zavisnosti od nivoa i veličine lezije, najčešće se prezentujući bolom u torakalnoj regiji, sa radikularnom distribucijom, unilateralnim ili bilateralnim senzornim simptomima i mišićnom slabošću, u zavisnosti od nivoa i disfunkcije sfinktera [2].

Operacija je indikovana kod pacijenata sa motornom slabošću i disfunkcijom sfinktera. Dva glavna hirurška pristupa jesu posterolateralni i prednji, koji podrazumevaju ili transtorakalni pristup (transsternalni, transpleuralni, retropleuralni) ili torakoskopiju [3]. Usled značajne stope komplikacija, kao što su: neurološko pogoršanje, formiranje duralne fistule, i upala pluća, posebno se mora paziti prilikom razmatranja hirurške intervencije kod pacijenata sa blagim simptomima [3,4]. Kod naše pacijentkinje, uprkos tome što je diskalna masa zauzela značajan deo kičmenog kanala, uz vidljivi efekat pritiska na kičmenu moždinu i nervni koren, odlučili smo se da nastavimo sa konzervativnim lečenjem, zbog odsustva znakova mijelopatije i nepostojanja ozbiljnijih neuroloških simptoma.

Spontana resorpcija uklještenog diska na nivou cervikalne i lumbalne regije dobro je dokumentovana u literaturi [2,5-8]. Spontana resorpcija hernijacije torakalnog diska jeste opisana, ali nije postignut opšti konsenzus po pitanju parametara koji bi definitivno mogli da predvide takav događaj [5]. Smatra se da površinski veća izloženost diska epiduralnom prostoru, a samim tim i vaskularizacija, igraju ključnu ulogu u spontanoj resorpciji uklještenog diska [1,9]. Neovaskularizacija sa ekspresijom matriksne metaloproteinaze-3 (MMP-3) i matriksne metaloproteinaze -7 (MMP-7) indukovane makrofagima (koje prevashodno razgrađuju agrekan i proteine kolagena) potpomaže proces resorpcije [1,10-12]. Takođe, faktor tumor nekroze-alfa (engl. *tumor necrosis factor-alpha* - *TNF-α*) indukuje ekspresiju receptora vaskularnog endotelnog faktora rasta (engl. *vascular endothelial growth factor receptor* - *VEGFR*) i neoangiogenezu, što se na magnetnoj rezonanci pojačanoj gadolinijumom prikazuje kao rubno pojačanje oko uklještenog diska [1,6,13-17]. Ovo rubno pojačanje, prisutno i kod naše pacijentkinje, može dovesti do pogrešnog dijagnostikovanja intraduralnog

characteristic appearance of disc herniation, and, since symptoms were minimal and already improved, we suggested non-surgical conservative treatment, including initial bedrest for several days, followed by physical therapy. The follow-up MRI of the thoracic spine, performed nine months after the first examination, revealed significant disc resorption (Figure 3). The total follow-up of the patient was 24 months, during which time no complication or neurological deterioration occurred.

DISCUSSION

Most disc herniations in the thoracic segment are asymptomatic. Clinical presentation varies depending on the level and the size of the lesion, most commonly presenting with pain in the thoracic region, with a radicular distribution, unilateral or bilateral sensory symptoms and muscle weakness, depending on the level and sphincter dysfunction [2].

Surgery is indicated in patients with motor weakness and sphincter dysfunction. Two major surgical approaches are: the posterolateral and anterior, which include either the transthoracic approach (transsternal, transpleural, retropleural) or thoracoscopy [3]. Due to a significant rate of complications such as: neurological deterioration, dural fistula formation, and pneumonia, special care should be taken when considering surgery in patients with mild symptoms [3,4]. In our patient, despite the discal mass occupying a significant portion of the spinal canal, with an apparent compression effect on the spinal cord and spinal root, we decided to proceed with conservative treatment, due to the absence of myelopathy signs and lack of serious neurological symptoms.

Spontaneous resorption of a herniated disc is well documented at the cervical and lumbar levels [2,5-8]. Spontaneous resorption of thoracic disc herniation has been reported, but no major consensus has been achieved concerning the parameters that could definitely predict such an event [5]. It is believed that exposure of the disc to the epidural space, and consequently vascularization, play a major role in spontaneous herniating disc resorption [1,9]. Neovascularization with macrophage-induced expression of matrix metalloproteinase-3 (MMP-3) and MMP-7 (which predominantly degrade aggrecan and collagen proteins) facilitates the resorption process [1,10-12]. Additionally, the tumor necrosis factor-alpha (TNF-α) induces vascular endothelial growth factor receptor (VEGFR) expression and neoangiogenesis, documented on the gadolinium-enhanced MRI as rim enhancement surrounding the herniated disc [1,6,13-17]. This rim enhancement, which was also present in our patient, can lead to misdiagnosis of intradural tumor. According to

tumora. Prema Autiou i saradnicima debljina rubnog pojačanja uklještenog diska na MR, procenat dislokacije nukleusa pulpozusa, kao i starosna grupa od 41 do 50 godina, snažno koreliraju sa pojavom spontane resorpcije [1,18]. Sakai je opisao smanjenje simptoma u 75% slučajeva gde je bilo evidentnog rubnog pojačanja [19]. Haro i saradnici sugerisali su da bi pacijenti koji ne osećaju disfunkciju sfinktera niti progresivnu parezu, i kod kojih je vidno rubno pojačanje na MR snimku, trebalo da budu podvrgnuti fizikalnoj terapiji pre nego što se u razmatranje uzme hirurška intervencija [12]. Carreon i saradnici opisali su reakciju uklještenog diska koji sadrži pokrovnu ploču (engl. *end plate*) naglašavajući da prisustvo ovog tkiva umanjuje neovaskularizaciju i dalju spontanu resorpciju [6,15,16]. Uz enzimsku razgradnju, u literaturi su opisana još dva mehanizma: dehidracija i povlačenje u međupršljenski prostor [6,8,17-19]. Usled većeg sadržaja vode, mehanizam povlačenja može uključivati i dehidraciju i zapaljenje, pogotovo kod mlađih ljudi. Kao faktor koji utiče na spontanu resorpciju navedeno je i starosno doba, verovatno stoga što uklješteni diskovi kod starijih osoba sadrže manje tkiva nukleusa pulpozusa a više hrskavičavog tkiva anulusa fibrozusa, koje najverovatnije inhibira zapaljensku kaskadu, što za posledicu ima slabiji imuni odgovor i slabiju neoangiogenezu kod starijih pacijenata [20]. Orief i saradnici predložili su da, u slučajevima kada se magnetnom rezonancom utvrdi visok sadržaj vode u disku, treba sprovesti konzervativno lečenje. Redukcija uklještenene mase koja je vidljiva na MR ima dobru korelaciju sa poboljšanjem simptoma. Isti autori opisali su period oporavka od radikularnog bola u trajanju od 3 do 6 nedelja, dok je za resorpciju diska vidljivu na MR bilo potrebno od 4 do 9 meseci [6]. Isti obrazac pokazao se i kod naše pacijentkinje, gde je kliničko poboljšanje nastupilo pre poboljšanja vidljivog na snimcima.

Mogući znaci za predviđanje pozitivnog ishoda hernijacije torakalnog diska nisu u potpunosti razjašnjeni. Studija Splendiana i saradnika pokazala je da MR pruža prognostičke informacije o kliničkom toku hernijacije diska. Među 64 pacijenta sa 72 lumbalne hernijacije diska, spontano povlačenje uklještenja diska, potvrđeno uz pomoć NMR, utvrđeno je kod 34,7% pacijenata. Među ovim pacijentima, slobodni fragmenti diska (sekvestar) pokazali su znake potpunog povlačenja; hernijacije sa visokim intenzitetom signala na T2W sekvencama NMR regresirale su u 85,2% slučajeva; a hernijacije sa perfrenim prstenastim pojačanjem intenziteta signala regresirale su se kod 83% pacijenata [21]. Kod naše pacijentkinje, NMR karakteristike, naročito visoki intenzitet signala na T2W sekvenci, kao i periferno prstenasto pojačanje intenziteta signala, bile su prediktori za moguću spontanu resorpciju. Verovatno bi se mogla izvršiti ekstrapolacija

Autio et al., the thickness of the herniating disc's rim enhancement on the MRI, the percentage of dislocation of the nucleus pulposus, and the age group of 41-50 years, are strongly correlated with the occurrence of spontaneous resorption [1,18]. Sakai reported a decrease of symptoms in 75% of cases where marked rim enhancement was evident [19]. Haro et al. suggested that patients experiencing no sphincter dysfunction and no progressive paresis, and showing apparent rim enhancement on the MRI, should undergo physical therapy before considering surgery [12]. Carreon et al. described the reaction of a herniating disc containing an end plate, emphasizing that the presence of endplate tissue diminishes neovascularization and further spontaneous resorption [6,15,16]. In addition to enzymatic degradation, two more mechanisms can be found in literature: dehydration and retraction into the intervertebral space [6,8,17-19]. Due to higher water content, the regression mechanism may include both dehydration and inflammation, especially in younger people. Age has been suggested as a factor influencing spontaneous resorption, probably since herniated discs in older people have less nucleus pulposus tissue and more cartilaginous annulus fibrosus tissue, which most likely inhibits the inflammatory cascade, resulting in a weaker immune response and neoangiogenesis in older patients [20]. Orief et al. suggested that, when the MRI determines high water content in the discs, conservative therapy should be carried out. The reduction of herniating mass seen on the MRI correlates well with symptom improvement. The same authors also reported a radicular pain recovery period of 3 - 6 weeks, while disc resorption visible on the MRI took 4 - 9 months to occur [6]. The same pattern was present in our patient, with clinical improvement preceding radiological proof of resolution.

The possible predictive signs of the positive evolution of thoracic disc herniation have not been fully elucidated. A study by Splendiani et al. demonstrated that MRI offers prognostic information about disk herniation evolution. Among 64 patients with 72 lumbar disk herniations, spontaneous MRI confirmed regression of disk herniation was seen in 34.72% of patients. Among these patients, free disc fragments (sequester) regressed in all cases, herniations with high signal intensity on T2W MRI sequences regressed in 85.18% of the cases, and herniations with peripheral contrast ring enhancement regressed in 83% of patients [21]. In our patient, MRI characteristics, especially high signal intensity on the T2W sequence, as well as peripheral post-contrast ring enhancement, were predictive of possible spontaneous resorption. The results of the Splendiani et al. study could probably be

rezultata studije koju su sproveli Splendijani i saradnici na hernijacije torakalnih diskova, pogotovo što su i oni demonstrirali da klinički tok hernijacije diska nije pokazao bilo kakvu povezanost sa nivoom, lokalizacijom ili veličinom [20]. Ipak, potrebne su nove prospektivne studije koje bi proučile klinički tok diskus hernija na torakalnom nivou.

Skorašnja studija koju su sproveli Turk i saradnici pokazala je da je, uprkos radiološkom poboljšanju, indikacija za hiruršku intervenciju još uvek postojala kod visokog broja pacijenata sa hernijacijom lumbalnog diska, od kojih je značajan deo pokazao razvoj trajnih motornih deficita [22]. Situacija je, međutim, složenija kada je u pitanju torakalna regija. Smatramo da su za donošenje odluke o lečenju od ključnog značaja, kako kliničko tako i radiološko praćenje, pogotovo za pacijente sa hernijacijom torakalnog diska kod kojih se u početku ne javlja neurološki deficit i kod kojih nema kliničkih niti NMR znakova mijelopatije, što je bio slučaj sa našom pacijentkinjom.

ZAKLJUČAK

Kod pacijenata sa hernijacijom torakalnog diska, kod kojih nema kliničkih ni radioloških znakova mijelopatije, i koji se javljaju sa blagim simptomima, hiruršku intervenciju treba odložiti usled mogućnosti da dođe do spontane resorpcije uklještenog diska. Potrebna su dalja istraživanja koja bi identifikovala kliničke i radiološke znake prediktivne za moguću resorpciju torakalnog diska. Takođe su neophodna istraživanja mehanizama spontane resorpcije diska kako bi se definisali protokoli lečenja, te se izbegle nepotrebne operacije i hirurške komplikacije kod pacijenata sa visokom verovatnoćom spontanog povlačenja diskus hernije.

Sukob interesa: Nije prijavljen.

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extrapolated to thoracic disc herniations, especially since they also showed that disc herniation evolution did not demonstrate any association with level, location, or size [20]. However, new prospective studies examining the evolution of discus hernias at the thoracic level are needed.

A recent study by Turk et al. showed that despite radiological improvement, indication for surgery still existed in a high number of patients with lumbar disc herniation, a substantial share of which developed permanent motor deficits [22]. However, the situation is more complex in the thoracic region. We believe that clinical follow-up, as well as radiological monitoring, is crucial for decision making, especially in patients with thoracic disc herniation initially presenting without neurological deficit and without clinical and MRI signs of myelopathy, which was the case with our patient.

CONCLUSION

In patients with thoracic disc herniation, without clinical or radiological signs of myelopathy, and with mild complaints, surgery should be delayed due to the possibility of spontaneous herniated disc resorption. Further studies identifying clinical and radiological signs predictive of possible thoracic disc resorption are needed. Also, studies of the physiology of spontaneous disc resorption are necessary to define therapeutic protocols, in order to avoid unnecessary surgery and surgical morbidity in patients with a high probability of spontaneous resolution.

Conflict of interest: None declared.

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