SPONTANEOUS RESORPTION OF LARGE THORACIC DISC HERNIATION: A CASE REPORT

Rosanda Ilić¹, Vuk Aleksić¹,², Aleksandra Paunović³, Miloš Joković³, Svetlana Mijatović¹

¹ Klinika za neurohirurgiju, Klinički Centar Srbije, Beograd, Srbija
² Odeljenje neurohirurgije, Kliničko bolnički centar „Zemun”, Beograd, Srbija
³ Clinical Center of Serbia, Neurosurgery Clinic, Belgrade, Serbia

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
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

UHOD
Hernijacija torakalnog diska je retko stanje, koje čini 0.1 - 3.0% svih diskus hernija, a koje može zahtevati kompleksno hirurško lećenje [1,2]. Procenjuje se da je incidencija simptomske 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 najčešće 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 opisa, najčešće u Th12, usled većeg stepena mobilnosti kičme i nivo javljanja Th1 1–Th12. Spontanu regresiju torakalnog diska najčešće spišće u lumbalnu regiju, sa samo nekoliko opisa, najčešće u Th12, usled većeg stepena mobilnosti kičme i nivo javljanja Th1 1–Th12, usled većeg stepena mobilnosti kičme i nivo javljanja Th1 1–Th12. Ovo 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
Četdesetogodišnja 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 obrostan negativan. Nije utvrđeno prisustvo paraloloških refleksa ni senzornih deficitu.

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
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
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 meseća, 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 ležije, najčešće se prezentuju bolom u torakalnoj regiji, sa radikularnom distribucijom, unilateralnim ili bilateralnim sensornim simptomima i mišićnom slabоšću, u zavisnosti od nivoa i disfunkcije sfinktera [2].

Operacija je indikovana kod pacijenata sa motornom slabоšću 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 kičmeno moždini i nervni koren, odlučili smo se da nastavimo sa konzervativnim lečenjem, zbog odsustva znakova mijelopatije i nepotrebe konzervativne održavanja u slučaju ukleštenog diska [1,9].

Spontana resorpcija ukleštenog 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 opći 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 vaskularizaciju, igraju ključnu ulogu u spontanoj resorpciji ukleštenog diska [1,9]. Neovaskularizacija sa ekspresijom matriksne metalloproteinaze-3 (MMP-3) i matriksne metalloproteinaze-7 (MMP-7) indukovane makrofagima (koje prevashodno razgrađuju agrekan i proteine kolagenja) potpomaže proces resorpcije [1,10-12]. Takođe, faktor tumor nekrozealfa (engl. tumor necrosis factor-alpha - TNF-α) indukuje ekspresiju receptora vaskularnog endothelijalnog faktora rasta (engl. vascular endothelial growth factor receptor – VEGFR) i neoangiogenzu, što se na magnetnoj rezonanci pojačanoj gadolinijumom prikazuje kao rubno pojačanje oko ukleštenog 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 (trans-sternal, 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 predominate 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 uključenog diska na MR, procenat dislokacije nukleusa pulpozusa, kao i starosna grupa od 41 do 50 godina, snažno koreliraju sa pojavom spontanog resorpcija [1,18]. Sakai je opisao smanjenje simptoma u 75% slučajeva gde je bilo evidentnog rubnog pojačanja [19]. Haro i saradnici sugериsали su da bi pacijenti koji ne osećаju disfunkciju sfinкtera niti progresivnu parеzну, и код koјih je vidno rubno pojačањe на MR snimku, требало да дa будu podvrgnuti физичkoj терapiji пре негo што сe у razmatranje узме хируршka интервенциja [12]. Carreon i saradnici opisali су reаkciju uključenog diska koji sadrži покровну плочу (енгл. end plate) нaсплашивајући да prisustvo ovог tkiva уmanјuje neovaskуlarизaciju и dalju spontanu resorpciju [6,15,16]. Uz enzимsku razgradnju, u literaturi су описана joш два механизma: dehidracija и poвлаčење у međupршлjenски простор [6,8,17-19]. Usled већег сadrжања vоде, mehanizam povlačenja може уključиvati и деhidracija и zapaljenje, поготово код млађих ljudи. Кao фактор који утиче на spontану resорпцију наведено је i starosno doba, вероvатно stoga што uključeni diskovi kod starijih особa sadrže manje tkiva nukleusa pulpozusa a више hrskаvаčkог tkiva anulusa fibroзusa, koje najveрovатnije инhibира zapaljenсku kаскаду, што за posledicu ima slabiji уmи odgovor и sлаbiju neoangiогенеzu код старших pacijenata [20]. Orief и saradnici предложили су да, u slučajевимa код се magnetном rezonанском утврдити visok сadržaj vode u disku, treba срprovesti конzervативно ležеnje. Redukcija uključene mase koja je видљива на MR ima дубру korelaciju са poboljšanjem simptoma. Исти аутори opisali су period опопакавa od radikulалног болa u тrajanju од 3 до 6 недељa, dok je за resорпциjу diska видljиво на MR бilo потrebно од 4 до 9 месеци [6]. Исти обrazac pokazao se и код naše pacijentkinje, где je kлиничко побољšањe nastupilo pre побoljšањa vidljivог na snimcima.

Mogуći znaci za предviđањe pozитивног ishoda hеnријациje torакалног diska nisu u потpunosti razjašnjeni. Studija Splendianija и saradника показала je da MR прužа прогностичке информацијe o клиничком toku herniјациje дисka. Među 64 pacijenta sa 72 lumbalne herniјациje diska, spontano povlačењe uključеnja diska, потврđeno uz pomoć NMR, utvrđено je kod 34,7% pacijenata. Među ovim pacijentima, сlobodni фрагменти diska (севкестар) показали су значај натпревареног povlačењa; herniјацие са високим интензитетом signala на T2W секвенцама NMR регresиrale су u 85,2% slučajева; a herniјациje са perfирменim прстенастим pojačањем интензитeta signala regresirlе su se код 83% pacijenата [21]. Kod наše pacijentkinje, NMR karakterистике, naročito visоки интензитет сигналa на T2W секвенци, kao и перфирао прстенasto pojačање интензитeta сигнала, биле су предиктори за могућу spontanu resorpciju. Вероватно би се могла извршити ekstrapolaцion

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 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 sprovedli Splendidjani i saradnici na hernijaciji torakalnih diskova, pogotovo što su i oni demonstrirali da klinički tok hernijacije diska nije po-
kažao bilo kakvu povezanost sa nivoom, lokalizacijom ili veličinom [20]. Ipak, potrebne su nove prospektivne
stude koje bi proučile klinički tok disku hernije na to-
arakalnom nivou.

Skorašnja studija koju su sprovedli Turk i saradnici po-
kažala je da je, uprkos radiološkom poboljšanju, indikaci-
ja za hiruršku intervenciju još uvek postojala kod visokog
broja pacijenata sa hernijacijom lumbalnog diska, od ko-
jih je značajan deo pokazao razvoj trajnih motornih defi-
cita [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 radi-
ološko praćenje, pogotovo za pacijente sa hernijacijom
torakalnog diska kod kojih se u početku ne javlja neuro-
loški deficit i kod kojih nema kliničkih niti NMR znakova
mijelopatije, što je bio slučaj sa našim pacijentkinjom.

ZAKLJUČAK

Kod pacijenata sa hernijacijom torakalnog diska, kod
kojih nema kliničkih ni radioloških znakova mijelopa-
tije, i koji se javljaju sa blagim simptomima, hiruršku
intervenciju treba odložiti kod visokog broja pacijenata
sa hernijacijom lumbalnog diska, od kojih je u pitanju
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