

## CASE REPORT

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# Treatment Results of Posterior Instrumentation Applied to Thoracolumbar Spine in Multiple Segment Involvement in Seronegative Rheumatoid Arthritis

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**ABSTRACT** Spinal segment involvement is a common symptom in rheumatoid arthritis. The cervical region is the most commonly involved spinal segment in individuals with rheumatoid arthritis. Multiple involvement of thoracic and lumbar vertebrae is known to be rare. In patients with seronegative rheumatoid arthritis, this type of segment involvement is more severe and conservative treatment is insufficient in some cases and surgical interventions are taken. In our study, the clinical features of a 66-year-old female patient with multiple involvement in thoracolumbar segments were evaluated before and after physiotherapy and rehabilitation sessions with conservative treatment and the changes in the clinical condition were emphasized. The unique feature of our study is the discussion of the evaluation and treatment results of this rare pathological condition with this case report.

**Keywords:** Rheumatoid arthritis; physiotherapy and rehabilitation

Spinal involvement frequently occurs in rheumatoid arthritis (RA). The cervical segment involvement is known to be the most commonly affected vertebral region.<sup>1</sup> It is stated that the thoracic and lumbar regions are less affected in RA, which can be seen in both seropositive and seronegative forms, and there is a limited number of studies on multiple segment effects. Rarely, this type of rheumatoid synovitis erosion can involve both the thoracic and lumbar vertebral regions, and the clinical condition becomes more severe that the daily activities of the patient cannot be controlled by conservative treatment.<sup>2</sup> The multiple involvements in vertebral bodies and intervertebral discs may be affected through a synovitis or an extension of the inflammatory process from the apophyseal joints.<sup>3,4</sup> In this case report, the results of the first clinical evaluation after

surgery, physiotherapy and rehabilitation intervention and the results of the effectiveness of the physiotherapy program are presented. Segmental fusion surgery due to multiple involvement in the thoracolumbar region in a seronegative case is a rare clinical condition. The effectiveness of the physiotherapy and rehabilitation program presented in this case makes the study unique. Treatment outcomes of such a case have not been discussed before in the literature.

## CASE REPORT

*History of the patient:* A 66-year-old woman had seronegative rheumatoid arthritis (RA) according to the ACR (American College of Rheumatology) criteria's and Sjogren's Syndrome (SS) with vertebral involvement for six years and was medically treated.<sup>5</sup>

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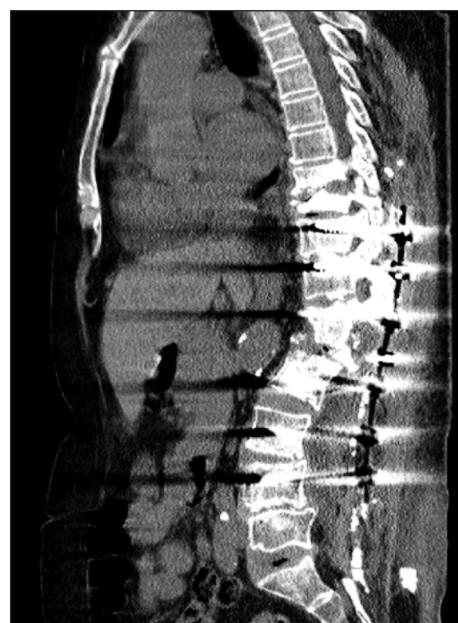
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In 2013, she was admitted to the hospital with the feeling of excessive tension and loss of function in her arms and she was diagnosed with seronegative RA and SS. In addition to this pathological condition, the patient had undergone an arthroscopic surgical operation after the protrusion of lumbar disc herniation (LDH) (L4-5), approximately 6 years ago and had a history of gait distribution until she completed the 10-day physical therapy program (both electrophysical agents and conventional exercise protocol for LDH) in the post-operative period. Also, there was atherosclerotic cardiovascular disease, gastroesophageal reflux and mild depressive disorder in the medical history of the case. Approximately one year ago, the patient had been treated with methotrexate 15 mg/week and hydroxychloroquine 200 mg/day for RA, due to the effect on the multiple segments of the thoracolumbar spine. During this period, the anti-cyclic citrullinated peptide anti-body (Anti-CCP) was 34 IU/mL. The rheumatoid factor (RF) was 10.1 IU/mL. Erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) level was 94 mm/hr, and 78.05 mg/dL, respectively. Besides, Disease Activity Score (DAS28) was 5.65 and the DAS28-CRP (i.e. the DAS28 using C-reactive protein instead of erythrocyte sedimentation rate) was 5. After the increment of back pain and other symptoms in the spine, the patient presented to the neurochirurgie clinic. After MR (magnetic resonance) imaging, the surgeon decided to perform posterior segmental instrumentation to T9-12, L2-5. MR and CT (computed tomography) images of the patient are presented in Figure 1, Figure 2.

*Surgical operation notes:* The operation was performed with a subcutaneous incision through T9-L5 levels by the surgeon. After placing the “widenear” on the site, the fascia was passed bilaterally through the midline and the paravertebral muscles were stripped. Following the automatic retractor placement on the field, the PSE system was placed. L1 partial corpectomy was performed by entering from both lateral sections of the existing laminectomy site and identifying T12 and L1 roots on both sides. Minimal dural tear occurred during corpectomy. Bilateral T10-L4 (bilateral T1 skipped) was aimed at the junction of the facets by the transverse process, and the tops were



**FIGURE 1:** Computed tomography image of the patient in the postoperative period.



**FIGURE 2:** Sagittal MRI image of the patient in the postoperative period.

rejuvenated with “rongeur” and then directed medially and downward by scope control. 12 U-shaped screws and two rods were used. Posterior segmental instrumentation was performed by connecting to one transverse connector.

**Physiotherapy sessions:** The patient presented to the physical therapy and rehabilitation unit on the 45<sup>th</sup> postoperative day with complaints of severe pain, limitation of movement and decreased functionality, strength loss and gait disturbance. The patient had no complaints of morning stiffness crepitus and night pain. In our first clinical assessment, the pain level was evaluated according to the Visual Analogue Scale (VAS).<sup>6</sup> The VAS of the low-back was six at rest and ten at the activity. For PROMs (Patient Reported Outcome Measures); anxiety was assessed with Hospital Anxiety and Depression Scale (HADS).<sup>7</sup> SF-36 (Short Form 36) and Rheumatoid Arthritis Quality of Life instrument (RAQoL) scale were used to evaluate the quality of life.<sup>8,9</sup> The scores of these first evaluations are presented in Table 1.

The patient underwent a 30-session physiotherapy program. The physiotherapy and rehabilitation program included passive, active assistive and active joint movement exercises and strengthening exercises that progressed gradually to the lower extremity. Besides, strengthening of the trunk muscles, proprioceptive neuromuscular facilitation exercises for the upper extremity and functional strengthening were performed. Balance and gait exercises were performed in combination with breathing exercises. Last day of the physiotherapy sessions, the case was evaluated secondly. The VAS of the low-back was 0 at rest and two at the activity. After the physiotherapy sessions; the pain level was decreased substantially.

**TABLE 1:** Results of the first assessment: HADS, SF-36 and RAQoL and subscales.

Scores		
<b>HADS</b>	Anxiety	18
	Depression	21
<b>SF-36</b>	Physical function (PF)	0
	Role limitations due to physical health (RP)	0
	Bodily pain (BP)	22.5
	General health (GH)	10
	Energy/Vitality (VT)	30
	Social function (SF)	0
	Role limitations due to emotional problems (RH)	0
	Emotional well-being (MH)	8
<b>RAQoL</b>	Total score	25

**TABLE 2:** Results of the second assessment: HADS, SF-36 and RAQoL and subscales.

		Scores
<b>HADS</b>	Anxiety	11
	Depression	1
<b>SF-36</b>	Physical function (PF)	0
	Role limitations due to physical health (RP)	0
	Bodily pain (BP)	100
	General health (GH)	65
	Energy/Vitality (VT)	85
	Social function (SF)	50
	Role limitations due to emotional problems (RH)	0
	Emotional well-being (MH)	80
<b>RAQoL</b>	Total score	18

Quality of life increased according to the results of RAQoL and many sub-scores of SF-36. In addition, according to the decrease in HADS score, it is seen that there are apparent decreases in depression and anxiety levels of the case. The scores of these second evaluations are presented in Table 2. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

## DISCUSSION

A clinical case report of involvement of a seronegative RA case was reported in this case report. The unique feature of our case was showing the effectiveness of surgical and physiotherapy applications according to the results of clinical evaluation. We can emphasize the importance of patient follow-up and evaluation in order to minimize the decrease in quality of life and functionality associated with clinical symptoms such as pain, gait distribution. We think that presenting the clinical symptoms of this rare case and presenting the effectiveness of the physiotherapy and rehabilitation program will be beneficial to clinicians in determining treatment programs.

According to the results of our study, the clinical parameters of the patient who underwent spinal fusion operation due to multi-segment involvement improved after the post-operative physiotherapy and

rehabilitation program. It should be emphasized that post-op strengthening exercises with a range of motion, functional strengthening, balance and gait training are important with the results of this rare clinical condition.

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### Conflict of Interest

*No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.*

### Authorship Contributions

*Idea/Concept: Özgür Nadiye Karaman, Fatih Özden; Design: Fatih Özden; Control/Supervision: Emine Aslan Telci; Data Collection and/or Processing: Özgür Nadiye Karaman; Analysis and/or Interpretation: Fatih Özden, Özgür Nadiye Karaman; Literature Review: Fatih Özden; Writing the Article: Critical Review: Özgür Nadiye Karaman, Fatih Özden, Emine Aslan Telci.*

## REFERENCES

- Wasserman BR, Moskovicich R, Razi AE. Rheumatoid arthritis of the cervical spine--clinical considerations. Bull NYU Hosp Jt Dis. 2011;69(2):136-48. [Crossref] [PubMed]
- Lee SH, Kang YM, Park YM. Multiple vertebral involvement of rheumatoid arthritis in thoracolumbar spine: a case report. J Korean Med Sci. 2010;25(3):472-5. [Crossref] [PubMed] [PMC]
- Babyn P, Doria AS. Radiologic investigation of rheumatic diseases. Rheum Dis Clin North Am. 2007;33(3):403-40. [Crossref] [PubMed]
- Baggenstoss AH, Bickel WH, Ward LE. Rheumatoid granulomatous nodules as de-structive lesions of vertebrae. J Bone Joint Surg Am. 1952;24A(3):601-9. [Crossref] [PubMed]
- Neogi T, Aletaha D, Silman AJ, Naden RL, Felson DT, Aggarwal R. The 2010 American College of Rheumatology/European League Against Rheumatism classification criteria for rheumatoid arthritis: phase 2 methodological report. Arthritis Rheum. 2010;62(9):2582-91. [Crossref] [PubMed]
- DeLoach LJ, Higgins MS, Caplan AB, Stiff JL. The visual analog scale in the immediate post-operative period: intrasubject variability and correlation with a numeric scale. Anesth Analg. 1998;86(1):102-6. [Crossref] [PubMed]
- Aydemir Ö, Güvenir T, Küey L, Kultur S. [Hospital Anxiety and Depression Scale Turkish form: validation and reliability study]. Türk Psikiyatri Derg. 1997;8(4):280-7.
- Koçyiğit H, Aydemir Ö, Fişek G, Ölmez N, Memiş A. [The validity and reliability of Turkish version of the short form 36 (SF-36)]. Turkish J Drugs Therap. 1999;12(2):102-6.
- Kutlay S, Küçükdeveci AA, Gönül D, Tenant A. Adaptation and validation of the Turkish version of the Rheumatoid Arthritis Quality of Life Scale. Rheumatol Int. 2003;23(1):21-6. [Crossref] [PubMed]