

## Nosocomial spondylodiscitis after intradiscal electrothermal therapy: Case series

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### Abstract

Intradiscal electrothermal therapy (IDET) is a method applied for treatment of pain caused by the disc and involves reaching spinal disc through a catheter under fluoroscopy and solidifying disc interior by heating.

We retrospectively evaluated ten patients treated and followed up with diagnosis of nosocomial spondylodiscitis after IDET. Ten patients, to whom IDET was applied for low back pain treatment in a tertiary healthcare organization, came with complaints of fever and low back pain during postoperative process.

Appropriate antibiotics treatment was commenced after the reproduction of *Pseudomonas aeruginosa* in abscess culture. Even though spondylodiscitis developing after IDET is a rare complication, it is also a clinical condition that needs to be thought in the patients whose complaints increase and clinically do not recover after the procedure. Adherence to rules of the asepsis will reduce the frequency of infection as in all nosocomial infections.

**Keywords:** IDET, Nosocomial, Spondylodiscitis

### Introduction

Intradiscal electrothermal therapy (IDET) is a method applied for treatment of pain caused by the disc and the procedure consists of reaching spinal disc through a catheter under fluoroscopy and solidifying disc interior by heating. Infection has been reported after intradiscal treatment techniques particularly diagnostic discography.<sup>1</sup> However, development of infection after IDET has not been encountered in the literature. Deficiency in following the rules of asepsis will increase the frequency of nosocomial infections. Ten cases were presented to highlight the importance of sterility in hospital infections.

### Case Series

Ten patients, in whom IDET was performed for treating pain caused by the disc in a tertiary healthcare organization, applied to our hospital during the

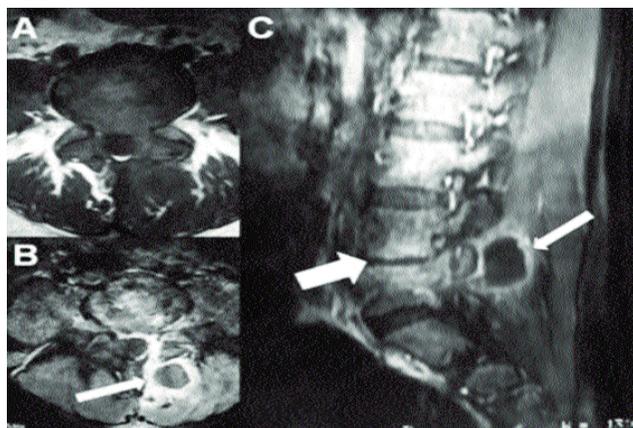
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postoperative period due to complaints of high fever and continuous low back pain. These patients were treated and followed-up in Gaziantep University Medical Faculty Hospital, Clinic of Infectious Diseases and Microbiology during 7-8 months in 2012.

IDET was performed in all of them at a tertiary clinic in January 2012 for complaint of chronic low back pain. After the procedure, low back pain significantly increased in all patients and they were not able to walk; additionally, two of them had severe burning sensation at the point of procedure. Table summarizes demographic data, clinical and laboratory findings of the cases. Physical examination showed sensitivity on the operation area and one patient had loss of sensation in L5-S1 dermatome in the left lower extremity. Fever was above 38°C in all of the patients (mean 38.2±0.8°C).

Abscess materials and peripheral blood cultures were collected under sterile conditions to identify the microorganism and gravity and cultures. Those with positive signals were processed by being followed in the automated blood culture system Bact/Alert (Biomerieux, France). Diagnostic criteria of CDC/NHSN were used for diagnosis of nosocomial spondylodiscitis (vertebral disc space infection).<sup>2</sup>



**Figure:** Preoperative T1 weighted axial MR image demonstrating patch-like hypo/hyper-intensity areas in the L4-L5 disc space, and the round lesion is isointense to muscle in the left paravertebral muscle (A, thin arrow). After contrast medium, the axial (B) and sagittal (C) T1 weighted images showing spondylodiscitis (C, thick arrow) and abscess formation just behind the left L4-5 facet joint. Note that the ring enhanced contrast involvement of the wall in the abscess (B and C, thin arrow).

**Table:** Demographic data, laboratory and location of infections of the patients.

Patient No.	Age (years)	Sex	White Blood Cell Count/ $\mu$ L	Sedimentation Rate (mm/h)	CRP mg/l	Alkaline Phosphatase (U/L)	Location of infections
1	65	M	7.600	38	64	120	L4-L5
2	22	M	11.100	46	69.5	82	L4-L5 and paravertebral abscess
3	27	F	14.100	36	48	106	L5-S1
4	23	F	5.300	80	27.1	80	L4-L5
5	55	F	6.800	50	44.8	83	L4-L5
6	42	F	11.400	12	23.3	57	L4-L5, S1
7	48	F	7.900	75	91	96	L4-L5
8	38	M	9.000	16	20	78	L4-L5
9	21	F	12.000	46	61	136	L5-S1
10	48	F	19.100	94	42.1	71	L5-S1

Antibiotherapies were started on patients, who were diagnosed with nosocomial spondylodiscitis, according to their antibiograms. All of the patients had used prophylactic antibiotic (Cefazolin) before the procedure.

In both contrast and enhanced Magnetic Resonance Imaging (MRI) symptoms compatible with spondylodiscitis were observed in vertebrates between L4-L5 in six cases, L5-S1 in three cases, both L4-L5 and L5-S1 in one case (Figure). Besides, abscess formation was detected in left paravertebral region in one case, (Figure A,B and C).

Abscess drainage and abscess wall resection were performed to the case, for which paravertebral abscess was determined, by surgical operation. In the histopathological examination of abscess material, imaging compatible with acute inflammation was determined and *Pseudomonas aeruginosa* reproduced in cultures of the blood and abscess materials that were taken simultaneously. Microorganism was sensitive to Meropenem and Ciprofloxacin. The same microorganism was reproduced in blood cultures of both patients.

Since patients came to our hospital within the same time interval during post-operative period due to similar complaints, a source of contagion was looked for nosocomial infection. It was stated that the same bacteria were reproduced in the solution used for asepsis.

Considering that other patients had the same operation in the same center and applied with the same complaint, it was thought that they were infected with the same microorganism. Therefore, other patients were also diagnosed with nosocomial spondylodiscitis according to the CDC/NHSN diagnostic criteria before the invasive procedure, and Meropenem (3 G/day) was started parenterally according to the antibiogram results. Their

fever normalised and their pain decreased during the treatment process. All of the patients were discharged with oral Ciprofloxacin and Rifampicin after receiving parenteral antibiotics treatment for nearly 21 days (mean  $23.32 \pm 6.4$  days). Patients, whose clinical and laboratory findings returned to normal values during their hospitalization, were called for routine polyclinic controls.

## Discussion

Intradiscal electrothermal treatment has been used by specialists for more than ten years in discogenic pain treatment.<sup>3</sup> Collagen structure of the disc is changed and nociceptors are coagulated by penetrating into nucleus pulposus through annulus fibrosis posterior using a percutaneous needle or a cannula in intradiscal treatment techniques similar to IDET.<sup>3</sup> Clinical success of the procedure is generally about 60%.<sup>3</sup> Complications may develop after the procedure.

Spondylodiscitis is intervertebral disc's and vertebra's getting infected generally due to the bacteria. Spondylodiscitis can be classified as spontaneous and postoperative. Spontaneous spondylodiscitis is spinal infections caused by spreading of community-acquired or nosocomial infections from a distant point via blood in general. On the other hand, postoperative spondylodiscitis (POS) is an infection caused by direct contamination of disc space with pathogens existing in patient's skin flora as a result of interventions performed for the purpose of diagnosis and treatment.<sup>4</sup> It is thought that pathogen microorganisms develop in pathogenesis of POS during the operation as a result of direct inoculation.

Disc infection after diagnostic discography is a well-defined complication. Discitis develops as a result of microorganisms' being carried by needle and the most frequent microorganisms are *S.aureus* and *S.epidermidis*.<sup>5</sup> CDC's recommendation is to apply antimicrobial

prophylaxis in discography or other intradiscal treatment methods. Accordingly, before or during the procedure, Cefazolin, Clindamycin or Vancomycine should be applied as intradiscal.<sup>6</sup> Nevertheless, there are also comprehensive studies recommending that prophylactic antibiotics usage is unnecessary.<sup>7</sup>

Application of needle and similar materials, which are used during IDET and such intradiscal treatments, into disc space has infection risk.<sup>5</sup> However, although development of spondylodiscitis has been reported after other intradiscal techniques especially diagnostic discography, infection associated with IDET has not been specified.<sup>8</sup> A number of specialists apply intradiscal and/or intravenous antibiotics prophylactically during IDET. Usage of prophylactic antibiotics during IDET is similar to that in discography: Cefazolin, clindamycin or Vancomycine may be preferred.<sup>5</sup> In this study, all of the patients had used prophylactic antibiotics before the procedure. But, Cefazolin used as a prophylactic antibiotic was not effective to *P. aeruginosa*.

First symptom of discitis is worsening of pain. Clinical presentation and timing are generally variable. Increase in complaint of post-operative pain is a crucial result. In all cases, increase in pain is an important reason for applying to a hospital. Spondylodiscitis should be considered in all patients whose post-operative complaints do not decrease.

Being suspicious in diagnosis and showing the changes in the disc structure via imagining methods (MRI) are important. MRI images have been helpful in diagnosing for all our patients. It should be right to make an MRI examination for patients thought to have spondylodiscitis.

The correct choice of antibiotics should be based on antibiotic susceptibility results. The fact that *Pseudomonas aeruginosa* reproduced in abscess material of one of our cases and in simultaneous blood cultures in two patients enabled us to choose appropriate antibiotics for the treatment.

Search for source upon determination of nosocomial infection is a necessary procedure. Therefore environmental cultures should be taken. It was concluded that since all the cases were operated in the same healthcare organization around the same dates, the infection was nosocomial. In the environmental cultures

done, the source of infection was identified by reproducing bacteria in the solution used for asepsis. *Pseudomonas aeruginosa* is the most frequent microorganism found in asepsis materials.<sup>9</sup> Infection risk can only be reduced by using strict aseptic techniques.

## Conclusion

Spondylodiscitis developing after IDET is a necessary condition which should be taken into consideration for the patients whose complaints increase during postoperative period. It requires appropriate follow-up and treatment. For the prevention of hospital infections, adherence to rules of asepsis is very important. This reduces the frequency of infection as in all nosocomial infections.

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**Conflict of Interest:** None.

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