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## Spinal Anaesthesia Application with Two Different Approaches in Two Cases of Ankylosing Spondylitis

Ankylosing Spondylitis (AS) is a subset of axial spondyloarthritis and it is involving primarily the axial skeleton and sacroiliac joints. An anaesthesia plan should be created by considering 4 important factors in patients with AS. The degree of the upper airway involvement, limited thoracic expansion, cardiac involvement and neuraxial block application difficulties need to be considered. A variety of alternative approaches such as awake video laryngoscopic intubation, laryngeal mask application, caudal anaesthesia and spinal anaesthesia with lateral approach applications as well as the standard general and neuraxial techniques were defined for these patients. We also aimed to present spinal anaesthesia that we applied with a different approach in two patients.

We have also seamlessly performed spinal anaesthesia application in our first case in head up (semi-sitting) lateral position and intra-operative hemodynamic change was not observed. In the second case, we were successful with the lateral approach after unsuccessful spinal anaesthesia attempt with midline approach again in sitting position.

In conclusion; by the patients with AS, it should be considered that spinal anaesthesia can be applied more easily with midline approach in lateral semi-sitting position or lateral approach in sitting-position, without insisting on the midline technique in cases where the midline technique is difficult to be performed.

**Key Words:** Ankylosing spondylitis, spinal anaesthesia

### Ankilozan Spondilitli İki Olguda İki Farklı Yaklaşımla Spinal Anestezi Uygulaması

Ankilozan spondilit bir aksiyal spondiloartrit tipidir ve özellikle aksiyal iskeleti ve sakroiliyak eklemleri tutar. Ankilozan spondilitli bir hastada anestezi planı 4 önemli faktör düşünülerek yapılmalıdır. Üst hava yolunun tutulum derecesi, toraks ekspansiyonunun kısıtlanması, kardiyak tutulum ve nöroaksiyel blok uygulamanın zorluğu değerlendirilmelidir. Bu hastalarda, standart genel ve nöroaksiyel tekniklerin yanı sıra, uyanık videolarinoskopik entübasyon, laringeal maske uygulaması, kaudal anestezi ve lateral yaklaşımlı spinal anestezi uygulamaları gibi çeşitli alternatif yaklaşımlar da tanımlanmıştır. Biz de iki hastada farklı yaklaşımla uyguladığımız spinal anesteziyi sunmayı amaçladık.

İlk vakada baş yukarıda (yarı-oturur) lateral pozisyonda spinal anestezi uygulaması yaptık ve intraoperatif hemodinamik değişiklik gözlenmedi. İkinci vakada ise oturur pozisyonda orta hat yaklaşım ile başarısız spinal anestezi denemesinden sonra paramediyal yaklaşımla başarılı oldu.

Sonuç olarak; AS'li hastalarda orta hat tekniğinin güç olduğu tahmin edilen olgularda bu teknikte fazla ısrar etmeden, oturur pozisyonda lateral yaklaşım veya lateral yarı oturur pozisyonda orta hat yaklaşımıyla spinal anestezinin daha kolay uygulanabileceği göz önünde bulundurulmalıdır.

**Anahtar Kelimeler:** Ankilozan spondilit, spinal anestezi

### Introduction

Ankylosing Spondylitis (AS) is a subset of axial spondyloarthritis and it is involving primarily the axial skeleton and sacroiliac joints (1). Calcifications in the ligament generate to build interspinal bone bridges between lumbar vertebrae and cause classical bamboo spine radiological images (2). An anaesthesia plan should be created by considering 4 important factors in patients with AS. The degree of the upper airway involvement, limited thoracic expansion, cardiac involvement and neuraxial block application difficulties need to be considered. A variety of alternative approaches such as awake video laryngoscopic intubation, laryngeal mask application, caudal anaesthesia and spinal anaesthesia with lateral approach applications as well as the standard general and neuraxial techniques were defined for these patients (3-6).

We also aimed to present spinal anaesthesia that we applied with a different approach in two patients.

### Case Report

**Case 1:** Patient has been diagnosed ankylosing spondylitis for 22 years and was planned medial malleolus fracture operation. It has been informed that in another center, due to failure of spinal anaesthesia and possibility of failure of providing airway due to AS, the operation has been cancelled. Anteroposterior and lateral lumbar spine radiograph had the look of severe ankylosis compatible with bamboo spine appearance (Figure 1, 2). In this case spinal anaesthesia was attempted 2 times to the patient with midline approach at first from the range of L3-4 in the sitting position, but it was unsuccessful. After that by laying the patient on his side, head 45° up, spinal anaesthesia performed with midline approach from the range of L3-4 in the semi-sitting position was successful.



**Figure 1.** The image of the first case in the supine position



**Figure 2.** Lumbar spine x-ray image of the first case

**Case 2:** Patient has been diagnosed ankylosing spondylitis for 10 years and was planned right femur fracture operation. Anteroposterior and lateral cervical spine radiograph had the look of severe ankylosis. Lumbar spine radiograph for the patient, who was unable to stand and unable to lie back, was attempted two times but cannot be performed (Figure 3, 4). In this case spinal anaesthesia was attempted 2 times to the patient with midline approach from the range of L4-5 in the sitting position, but it was unsuccessful. Then the needle tip was slightly directed from L4-5 range, 1.5 cm lateral of the midline, upwards and medial across the lamina of the lower vertebral lamina. Spinal anaesthesia performed with lateral approach successfully on the first attempt.



**Figure 3.** The image of the second case in the supine position



**Figure 4.** Cervical spine x-ray image of the second case

## Discussion

Neuraxial anaesthesia may be preferred as an alternative to general anaesthesia for the patients with AS to be performed by perineum and lower extremity surgery. However, ossification of the interspinous ligaments and ligamentum flavum, the formation of bone bridges between vertebrae enforce insertion of the epidural or spinal needle (2, 3, 7). Regional anaesthesia may be contraindicated for three reasons. First; ossification of the interspinous ligaments and bone bridge formation can make impossible needle or catheter to be placed, second; a higher incidence of vertebral fractures, and the third; complications of regional anaesthesia such as intravenous injection, requires airway manipulation under difficult conditions (8).

In a retrospective study neuraxial anaesthesia was applied 19.5% of 82 patients with AS. Success was achieved in 76.2% of these patients, all epidural anaesthesia attempts were failed (9). In an another study, spinal anaesthesia, that can not be performed with approach from midline, with lateral approach was successfully applied in 3 patients (5). In our 2<sup>nd</sup> case, when two attempts of spinal anaesthesia application with approach from midline was not successful, a successful block was provided with lateral approach.

Hoffman et al. (10) have planned epidural analgesia for the purpose of labor analgesia in patient with severe

AS. Despite two successful placements of lumbar epidural catheters, adequate rostral spread of local anaesthesia to control labour pain was never achieved via the epidural route. Thus, continuous spinal analgesia was used, which provided effective labour analgesia in this patient. They stated that posterior longitudinal ligament is calcified, prevents local anaesthetic agent to spread.

In the recent studies, it's been shown that conventional sitting and lateral positions were modified by combining; block application success is high in head up (semi-sitting) lateral positions and hemodynamics progresses more stable (11). We have also seamlessly performed spinal anaesthesia application in our first case in head up (semi-sitting) lateral position and intraoperative hemodynamic change was not observed. In the second case, we were successful with the lateral approach after unsuccessful spinal anaesthesia attempt with midline approach again in sitting position.

In conclusion; in the patients with AS, it should be considered that spinal anaesthesia can be applied more easily with midline approach in lateral semi-sitting position or lateral approach in sitting-position, without insisting on the midline technique in cases where the midline technique is difficult to be performed.

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