Scholars Journal of Medical Case Reports
Abbreviated Key Title: Sch J Med Case Rep
ISSN 2347-9507 (Print) | ISSN 2347-6559 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Anesthesiology and Intensive Care

Anesthesia Strategies for Patients with Ankylosing Spondylitis Undergoing Total Hip Replacement Surgery

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DOI: 10.36347/sjmcr.2022.v10i08.012 | **Received:** 04.07.2022 | **Accepted:** 11.08.2022 | **Published:** 13.08.2022

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Abstract | **Case Report**

Ankylosing spondylitis (AS) is a chronic inflammatory disease of the axial skeleton and peripheral joints. Its main characteristic is the fusion of vertebral bones, which leads to loss of flexibility of the back and neck. Who present the most challenging regional anesthesia and airway management for the anesthesiologists. We report a case of patient admitted for total hip replacement under général anesthésia by fiberoptic bronchoscope. The objective of this study is to discuss the various general and locoregionale anesthetic techniques.

Keywords: Anesthesia, ankylosing spondylitis, total hip replacement surgery.

INTRODUCTION

Ankylosing spondylitis (AS) is an inflammatory disease of unknown origin that often results in gradual ankylosis of the affected joints. The onset of AS often occurs at a relatively young age [1]. It is deemed that the younger the age at the onset, the greater is the likelihood of hip involvement [2]. Male, axial disease, and enthesitis are also regarded as risk factors of hip involvement and the need for total hip arthroplasty (THA) in AS [3, 4]. Hip involvement occurs in 25–50 % of patients with AS, and 47–90 % of patients who have such involvement have it bilaterally [3].

Patients with AS needing THA are seen frequently. Preparation of these patients for surgery is challenging because they often have substantial airway restrictions and rigid spines.

In addition to conventional, standard general or neuraxial anesthesia techniques, there are numerous alternative anesthetic approaches described in the literature. These include awake videolaryngoscopic guided intubation [5], laryngeal mask airway [6], ultrasound-assisted central neuraxial blockade, lateral approach in placement of the spinal anesthesia needle [7, 8], and others.

CASE PRESENTATION

A 26-year-old male, weighing 67kg, size: 1.74m, body mass index: 22.12 kg/m^2, admitted for total hip replacement (left) was a known case of severe AS in an advance stage. He had a deformed rigid spine from the neck down to the lower back with a stooped (classical bamboo spine) (Figure 1 & 2), without any mobility of head and neck..Both the hip joints had a limited mobility and he was unable to even sit for the last 2 years.

The physical examination showed restricted joint movements. The range of motion of the left hip was: flexion 30°, extension 0°, adduction 10°, abduction 20°, and external rotation 20°. The cardiac and respiratory systems were normal on examination.Laboratory examinations were in normal range. A preoperative X-ray showed that the left hip had bony ankylosis.

Anesthetic assessment revealed very limited neck movement; thyromental distance: 5 cm, Mallampati Class IV airway and marginal mouth

opening of only 2 cm. We discussed with a patient the anticipated difficulties and impending dangers and outcomes of anesthesia and obtained advanced informed consent, for both general and conventional neuraxial anesthesia.

The strategy was to first attempt a spinal anesthesia, and if that failed, the alternative plan was an awake intubation with a fiberoptic brochoscope.

On arrival in the operating room, routine monitoring was applied included ECG, noninvasive arterial pressure (SpO2), and equipment for difficult intubation was checked and on standby. Two intravenous lines and one arterial line were secured under local anesthesia.

Under full aseptic precaution, in the sitting position, a local anaesthesia of the skin was carried out by 2% lidocaine ; Classical spinal anesthesia was attempted with 23 g quinkeys spinal needle both midline and paramedian approach by two experienced anesthesiologists. Even after three attempts lumbar puncture was unsuccessful. We decided to try awake intubation by fiberoptic bronchoscope.

The patient was put into dorsal decubitus with a support under the head. Premedication by 0,25 mg atropine to prevent vago vagus reflex. Then a local nasal anesthesia was applied by the nebulization of 4 ml of Lidocaine 5% with 6 to 8 l/min of oxygen for 20 min. Bilateral block of the Upper Laryngeal Nerve by Lidocaine 1%, (4 ml per laryngeal nerve) followed by trans-trachéal Instillation a 3ml of 2% Lidocaine. After 20 min A flexible intubation probe number 6.5, a balloon well deflated, was inserted into the Fiberscope, both lubricated with a KY type lubricant and the suction was plugged in and checked. The fiberscope was introduced through the most permanent nostril and the fiberscope was gradually moved to the glottis to the carina and then the tracheal intubation by sliding the probe onto the fiberscope, then anestehsia was induced with Fentanyl: 268 microgramme, propofol: 170 mg and succinylcholine: 70mg. Anesthesia was maintained with sevoflurane. Total duration of surgery was 2 hours and extubation passed without incident after full awakening of the patient.

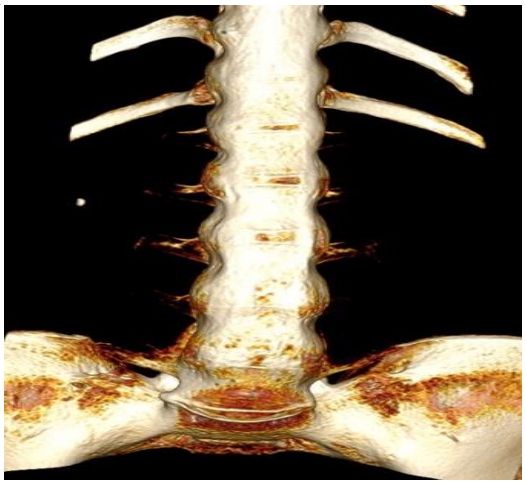

Figure 1: VRT view showing the "Bamboo spine" appearance

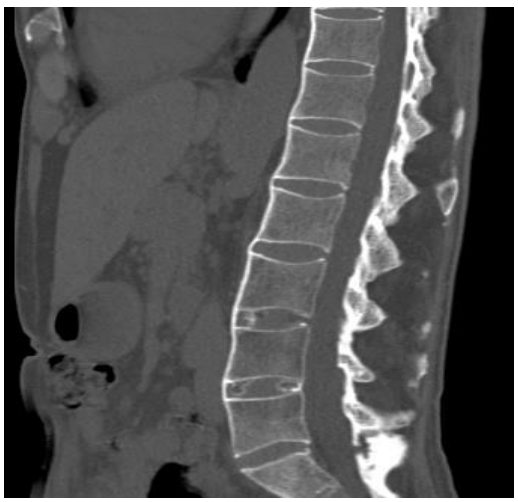

Figure 2: Ossification of the anterior longitudinal ligament and intervertebral discs

DISCUSSION

AS is a chronic inflammatory disease of the axial skeleton in which the inflammatory process starts from the sacro-iliac joints and spreads cephalad to affect the spine up to the cervical level along with costo-vertebral joints. There may be stiffness of the axial skeleton with ossification of axial ligaments and sacroiliac joints, along with decreased intervertebral spaces causing spinal rigidity [9]. The formation of bony bridges (syndesmophytes) between vertebrae results in a classic "bamboo spine" appearance.These changes make administration of both general and regional anaesthesia difficult. Regional anaesthesia offers many advantages over general anaesthesia in these patients, but central neuraxial blocks are known to be difficult, though not impossible, depending upon the severity of the disease [9].

Schelew *et al*., planned spinal anaesthesia in only16 patients out of which they reported success in 10 [10]. A paramedian approach may be easier because of the midline ossification of the interspinous ligaments. Taylor's approach, a paramedian approach to L5-S1 interspace, may also be better to access in some cases [11].

Goyal *et al*., have reported a case of young patient where conventional techniques failed and ultrasound helped in successful combined spinal–epidural technique . This technique has the advantage of ensuring a good anaesthesia with a possibility to re-inject local anesthetics in the peridural catheter in the peroperatory and a good quality post-operative analgesia during the first 48 hours of post-surgery via the peridural catheter [12].

Leung and al reported a case of a patient with advanced SA, they realised a mini-laminotomy under local anesthesia to expose the vertebral canal followed by insertion of a spinal catheter and injection of anesthetic agent was a success [13].

But Wittmann and Ring considered epidural or spinal anesthesia to be contraindicated in AS, because technical difficulties can also increase the risk of complications, like local anesthetic toxicity due to intravascular injection or a unpredictable level of anesthesia, with risk of total spinal anesthesia, and respiratory insufficiency, have been reported [14]. Also some Cases of epidural hematomas after epidural anesthesia have been reported [15].

In our patient after failed a multiple attempts for classical spinal anesthesia both midline and paramedian approach, we decided to try awake naso tracheal intubation with a fiberoptic bronchoscope, because the mobility of the spine has been reduced and others difficult predictable intubation criteria was present in the literature, we found that general anesthesia was indicated if all regional anesthesia techniques failed or were contra indicated.

Lili and al had published a Comparison of the GlideScope (GS) With the Macintosh Laryngoscope for Nasotracheal Intubation in Patients With AS and they found that GS reduced the difficulty of tracheal intubation and provided a better laryngoscopic view with higher overall success rates and shorter duration of intubation attempts than the Macintosh laryngoscope for intubating AS patients, who preferred their airway management under general anesthesia [16]. But in our patient we chose the vigilant intubation to take a maximum of security in our patient who has many criteria of difficult intubation and who may have a difficult or impossible ventilation.

CONCLUSION

Ankylosing spondylitis patients posted for surgery, pose several anesthesia challenges. The choise between general and locoregionale anesthetic techniques is not easy because both present technical difficulties in achieving them, thats why the discussion is required between the patient, surgeon, and anesthesiologist, about the potential risks and benefits of regional and general anesthesia.

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