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Anesthetic challenges in a case of Rheumatoid Arthritis (RA): A case report

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Abstract

Objectives: Rheumatoid arthritis (RA) is a chronic systemic inflammatory disorder primarily affecting joints but also involving extra-articular systems such as the cardiovascular, respiratory, and hematological systems. This case report aims to highlight the challenges in anesthetic management of RA patients with interstitial lung disease (ILD) undergoing orthopaedic surgery.

Materials and Methods: A 72-year-old female with RA, ILD (methotrexate-induced), and severe comorbidities, including bi-ventricular failure, pulmonary hypertension, and atlanto-axial subluxation, presented for right hip arthroplasty. Due to multiple joint deformities and systemic complications, a comprehensive preoperative assessment was conducted. Spinal anesthesia was chosen using hyperbaric bupivacaine with buprenorphine, and invasive arterial and central venous lines were placed with difficulty due to limited neck mobility and wrist flexion deformities. Hemodynamic stability was maintained with blood replacement and norepinephrine infusion, and tranexamic acid was administered to minimize blood loss.

Results: The patient tolerated spinal anesthesia well, with stable intraoperative hemodynamics. Challenges included limited mobility, difficult vascular access, and the need for careful airway management due to cervical spine instability. Postoperative care was tailored to minimize RA progression and manage systemic complications.

Conclusions: RA patients undergoing surgery require thorough preoperative assessment, considering systemic involvement and medication effects. Spinal anesthesia is a preferable approach to avoid airway complications associated with atlanto-axial subluxation. Proper positioning, pressure point protection, and aseptic techniques are crucial due to joint deformities and immunosuppression. ILD must be carefully monitored, and individualized anesthetic strategies should be employed to enhance patient safety and surgical outcomes.

Keywords: Rheumatoid arthritis, interstitial lung disease, anesthesia, spinal anesthesia, orthopedic surgery, atlanto-axial subluxation, immunosuppression, perioperative management

Introduction

RA is known to be a chronic systemic inflammatory disorder characterized polyarthritis, articular cartilage loss, synovitis of joints and tendon sheath and also affecting the extra-articular sites such as the cardiovascular, respiratory and hematological systems rendering difficulty to the anaesthesiologists. Though inflammation has autoimmune nature, yet precise etiology remains unidentified. Symmetrical erosive polyarthropathy, which most frequently affects feet as well as hands joints, has been RA's hallmark ^[1]. Orthopaedic surgery under anaesthesia has frequently been a necessity to RA patients for controlling their condition or for non-RA-related surgeries ^[2]. Although major joints (like knee as well as hip) along with atlanto-axial joints may also be impacted, minor joints of hand, wrist, along with foot tend to be afflicted. Joint breakdown with laxity/disintegration of ligament as well as tendon is triggered by progressive joint synovial inflammation, which causes cartilage degradation as well as bone-erosion ^[3]. Low-level disease activity maintenance or clinical remission has been management's aim, which is achieved through aggressive early utilization of biological disease-modifying anti-rheumatic drugs as well as conventional targeted synthetic medicines ^[4]. These improve symptoms, inhibit disease progression, maintain joint function and facilitate the performance of activities ^[5]. It is crucial to take a thorough history of RA, taking into account duration as well as disease severity, medication status, along with systemic involvement ^[6]. Planning anaesthesia also requires thorough physical evaluation, particularly of airway.

Prior to anaesthesia, present medications along with systemic complications must be examined in addition to joint disabilities. Establishing a safe airway while maintaining cervical spine's integrity, successfully managing any systemic condition, preventing RA progression along with its associated consequences have been anesthetic management objectives. Interstitial Lung Disease (ILD) is a common pulmonary manifestation that may be related to the inflammatory process itself, infectious complications and to the treatments used. Adopting efficient, safe therapy approaches has been challenging as both biological as well as synthetic immunosuppressive drugs have been linked to ILD exacerbation or onset.

Case report

We describe 72-year-old female's case having osteoarthritis of the right hip as well as rheumatoid polyarthritis with ILD (methotrexate-induced) and bi-ventricular failure with EF of 28% with severe pulmonary arterial hypertension, kyphosis of spine and atlanto-axial-subluxation (Figure 1 and Figure 2), arthritis of the foot and toes (Figure 3) posted for right hip arthroplasty. She presented with complaints of right hip pain, difficulty in performing day-to-day activities and breathlessness at rest. Patient had multiple comorbidities,

including dyslipidemia, type 2 diabetes mellitus and hypertension. She was being treated with medium-to-high CCS (corticosteroids) as well as NSAIDs (nonsteroidal anti-inflammatory medications) dosages (up to 10 mg/day prednisone). Other clinical symptoms that could indicate connective tissue problems like skin thickening, Raynaud's phenomenon, dysphagia, sicca syndrome, rashes, myalgia, along with constitutional symptoms of sweats as well as fever, were not present. Chest X-ray showed ILD indications in lung's lower lobes with ground glass opacities (Figure 4). Diffuse arthropathic symptoms having initial early ulnar styloid erosions had been identified by hands and wrist's X-ray. Invasive arterial, central venous lines were placed which was difficult due to lack of neck movements and hyperflexion of the handmade line placement difficult. Spinal anaesthesia was given with 1.5ml of hyperbaric bupivacaine with 60 micrograms of buprenorphine in the sitting position and positioning was challenging due to extreme pain the patient faced. PRBC was ordered well before and initiated as soon as spinal was given. Hemodynamics were maintained by replacing blood with blood and minimal norepinephrine infusion. Tranexamic acid infusion was initiated to control the blood loss.

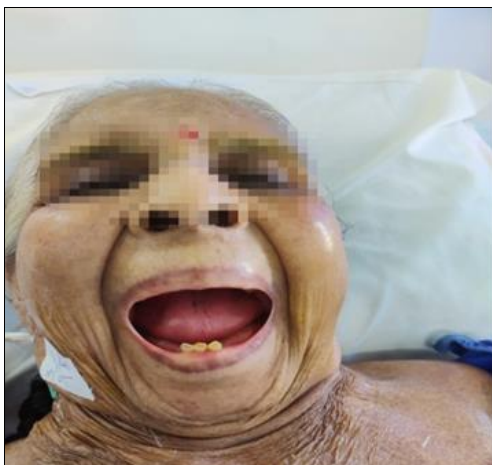


Fig 1: Atlanto-axial-subluxation



Fig 2: Atlanto-axial-subluxation



Fig 3: Arthritis (lateral deviation of toes)



Fig 4: Signs of interstitial lung disease

Discussion

Comprehensive medical history as well as physical evaluation must be performed along with a thorough examination of the airway particularly the range of

movements of the neck. Prior to surgery, cervical spine's range of motion (extension as well as flexion) should be evaluated. AAS (atlanto-axial subluxation), which can result in spinal cord compression along with atlanto-axial

instability, without or with vertebral artery compression, could be brought by transverse ligament attenuation as well as odontoid process erosion. Wrist flexion deformities, lack of neck movements, would make central line, arterial line placements difficult. Awake fiberoptic intubation is the choice for patients with RA if general anaesthesia is planned as these patients will be on immunosuppressive therapy, extreme aseptic precautions must be followed while performing central neuraxial blockade.

ILD has been a prevalent pulmonary symptom of RA which could have been connected with underlying disease's chronic inflammation^[7]. It has long been known that MTX causes lung disease in RA patients, and numerous papers have shown the onset or exacerbation of pneumonitis^[8]. UIP (Usual interstitial pneumonia) as well as NSIP (nonspecific interstitial pneumonia) are two most prominent histopathologic types of ILD; other forms are less frequently seen^[9].

Before beginning MTX, pulmonary function tests should be performed as a screening method to help uncover occult lung disease, according to British Society for Rheumatology's current guidelines for the management of individuals with RA^[10]. Intravenous evaluation is challenging when there is a joint deformity or thin, fragile skin. The radial artery may become inaccessible due to a malformation of the wrist joint. For optimal individual position both during and after surgery, motion range of the afflicted joints should be evaluated prior to the procedure. During surgery, careful placement is crucial. To prevent pressure sores, all pressure points need to be secured. Osteoporosis is caused by long-term steroid use; these individuals need to be handled carefully. Eye care should also be taken into account 15% of RA patients have keratoconjunctivitis, which puts them at risk for corneal ulcers, particularly when they are prone. Best alternative over general anaesthesia is regional anaesthesia wherever possible. Pressure point padding is necessary to avoid sores as the patients have thin and fragile skin. Depending on the systemic conditions, echocardiography, a pulmonary function test, and arterial blood gas analysis can be necessary.

Conclusion

Careful preoperative assessment is necessary before anaesthesia in order to reduce damage and avoid problems. Systemic issues associated with RA must be taken into account in anaesthetic management measures, and postoperative care should be tailored to each patient

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Conflict of Interest

Not available

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