Unusual presentation of more common disease/injury

Subarachnoid block in a case of rheumatoid arthritis with severe pulmonary fibrosis

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Summary

Rheumatoid arthritis (RA) is the most common chronic inflammatory arthritis, of unknown aetiology and a propensity to involve almost all organ systems. The anaesthesiologists should be aware of the associated airway pathologies, pain management techniques and adverse effects of drug therapies being used to treat RA. In this respect, we describe a 60-year-old female patient who presented with a diagnosis of RA with pulmonary fibrosis, and was scheduled for orthopaedic surgery for subcapital fracture of femur which was successfully managed using intrathecal bupivacaine and midazolam.

BACKGROUND

Rheumatoid arthritis (RA) is the most common chronic inflammatory arthritis. The exact aetiology is unknown but a complex interplay of genetic, environmental and immune function is suspected.¹ The characteristic features are symmetrical polyarthropathy and a propensity to involve almost all organ systems. The disease presentation can be acute or chronic and its course is typically marked by exacerbations and remissions. The commonly affected organ systems with relevance to anaesthesiologists are cardiovascular, respiratory, neuromuscular and haematological systems. Pleuropulmonary involvement manifests in the form of pleural effusion and extensive pulmonary fibrosis. The anaesthesiologists should be aware of the associated airway pathologies, pain management techniques and adverse effects of drug therapies being used to treat RA.² In this respect, we describe a patient of RA with pulmonary fibrosis scheduled for orthopaedic surgery that was successfully managed using spinal anaesthesia with the use of intrathecal midazolam.

CASE PRESENTATION

A 60-year-old female, non-smoker patient presented with a history of inability to bear weight on the right lower limb for 1 month without any history of associated trauma. The patient had chronic cough with expectoration for the past 4–5 years and complaints of breathlessness on moderate activities. There was no history of fever, chronic illness and previous surgery and drug allergies. The patient was not on medications for her complaints.

She was poorly built, weighing 45 kg and on general examination pallor was present. She was a febrile and there was no clubbing and lymphadenopathy. On examination of the respiratory system there were decreased movements and reduced chest expansions on the left side. The trachea was shifted to the left side and air entry was markedly decreased on the left side with the presence of rhonchi and bibasilar crepitations. An examination of the hand revealed radial

deviation of the wrist with ulnar deviation of the digits and hyperextension of proximal interphalangeal joints and flexion at distal interphalangeal joint. She was edentulous with adequate mouth opening (MP II), with normal neck and temporomandibular joint movements.

The patient was diagnosed as a case of RA with pulmonary fibrosis with subcapital fracture neck of femur right side and was scheduled for dynamic hip screw fixation.

INVESTIGATIONS

Routine haematological investigations were within normal limits. Sputum for AFB was negative and Rh factor positive. ECG revealed a right bundle-branch block (figure 1). Chest x-ray, posteroanterior view (figure 2), showed a homogenous patch of haziness in the left upper lung field with cystic areas in it with pulled-up hilum with a deviation of the trachea and mediastinum towards the left side. Reticular changes were present in bilateral lung fields with clear cardiopulmonary angles and a normal cardiothoracic ratio. Neck x-ray (anteroposterior view; figure 3) was normal. High-resolution CT demonstrated a cystic network in the upper lung zones. Pulmonary function tests were suggestive of restrictive lung disease with forced vital capacity (FVC of 1.5 liters), forced expiratory volume in first second (FEV1 of 1.09 liters) and FEV1/FVC ratio of 91%. The arterial blood gas analysis revealed a pO₂ of 96, pH of 7.34, pCO₂ of 51 and HCO₃ of 29. She was advised prednisolone 30 mg orally and nebulisation with injection budesonide 8 hourly, injection salbutamol and injection ipratropium bromide 6 hourly.

TREATMENT

The patient was counselled and an informed consent was taken for spinal anaesthesia. A difficult airway cart with fiberoptic bronchoscope and arrangement for surgical airway were kept ready. In the operating room the heart rate was 94/min, blood pressure 116/70 and oxygen saturation 95%. An intravenous access with 18 G cannula was

Figure 1 Chest radiograph.

obtained and the patient was positioned for subarachnoid block in a sitting position. After the preparation of the back, the subarachnoid space was located in L3–L4 interspace in the midline approach. After free flow of cerebrospinal fluid, 3 ml of 0.5% sensoricaine heavy with 2 mg of midazolam (preservative-free preparation) was given into the subarachnoid space. The patient was laid supine and supplemental oxygen with Hudson mask at a rate of 5 l/min was given and all the standard monitors were placed. After 5 min the level of anaesthesia was checked and the patient was shifted to the operating table. Surgery lasted for 1 h and the perioperative course was uneventful and the patient was shifted to postanesthesia care unit (PACU).

OUTCOME AND FOLLOW-UP

Surgery lasted for 1 h and the perioperative course was uneventful and the patient was shifted to PACU.

Figure 2 Arthritic changes hand palmar view.

Figure 3 Arthritic changes hand dorsal view.

DISCUSSION

RA is a chronic inflammatory arthritis, with a characteristic symmetrical polyarthropathy, involving proximal interphalangeal joints of hands and feet. Systemic involvement is common and is the result of small-sized and medium-sized artery vasculitis due to deposition of immune complexes. In the cardiovascular system, the manifestations are pericarditis, myocarditis and conduction defects.³ Neuromuscular involvement can be in the form of loss of strength in skeletal muscles and peripheral neuropathies. Anaemia of chronic disease is the most common haematological abnormality. Mild abnormalities of liver function and renal dysfunction are common in patients of RA.⁴ Pleuropulmonary complications are responsible for an increased morbidity and mortality in patients of RA and are more common in patients with severe chronic articular disease with high titres of rheumatoid factor and other systemic complications. The most common pulmonary manifestation is pleural effusion, which are small and asymptomatic. Rheumatoid nodules may develop in parenchyma and pleural surface which are visible on a chest radiograph. A form of progressive pulmonary fibrosis may occur in these patients, which is relatively rare. Clinically important interstitial lung disease occurs in 5–10% of patients with RA. These patients are dyspnoic with complaints of cough with bibasilar crepitations, clubbing of the digits and evidence of cor pulmonale.^{5–7} These changes can lead to restrictive lung dysfunction in due course of time. All this leads to ventilation–perfusion mismatch with the resultant decrease in arterial oxygenation. These patients may show rapid desaturation during apnoeic laryngoscopy and intubation despite adequate preoxygenation. Moreover, they may not be able to support ventilation in the postoperative period due to advanced restrictive disease and may need postoperative ventilator support. Cervical spine involvement is not infrequent and may result in pain and neurological complications. The most common lesions are atlantoaxial subluxations and separation of the atlanto-odontoid articulation which can be best assessed on lateral neck radiographs.^{8–9} Airway management in these patients may be difficult and needs special attention. Preparations must be made to restrict neck joint movements during intubation to avoid any neurological complications. The combination of limited joint movements especially cervical joint and temporomandibular joint may make

visualisation of the glottis difficult during conventional laryngoscopy and arrangements have to be made for awake fibreoptic intubation. Another major problem in anaesthetic management is caused by the side effects of drug therapy such as NSAIDs, steroids which can lead to gastric ulceration and reduced bone density, respectively.^{10 11} Use of methotrexate and tumour necrosis factor inhibitors (etanercept) has been implicated in causing haematological and pulmonary complications.¹² The aims of preanaesthetic assessment of patients with RA are to evaluate the extent of the disease, systemic involvement, airway pathology and side effects of concomitant drug therapy to reduce the risk of surgery and anaesthesia.

Learning points

- In view of the associated airway pathologies and problems related to pulmonary function, the most frequent form of anaesthesia for surgical procedures of lower limbs in patients of rheumatoid arthritis is subarachnoid anaesthesia.
- The addition of intrathecal midazolam to bupivacaine markedly improves the duration and quality of spinal anaesthesia and provides an increased length of perioperative analgesia without significant side effects.^{13 14}
- In a study on comparison of overall cost of surgery and hospital stay for orthopaedic surgery, spinal anaesthesia was more cost-effective than general anaesthesia.¹⁵
- However, the presence of deformities and their effect on positioning and access to regional anaesthetic techniques must be taken into account.
- Spinal anaesthesia along with a proper preoperative evaluation for associated features of airway involvement and systemic involvement is paramount in successful management of patients of rheumatoid arthritis presenting for surgery.

Competing interests None.

Patient consent Obtained.

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Ansari MS, Habib SK, Ahmad Siddiqui Q, Ahmad Z. Subarachnoid block in a case of rheumatoid arthritis with severe pulmonary fibrosis.

BMJ Case Reports 2012;10.1136/bcr-2012-006294, Published XXX

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