

Case report

Anesthetic Management of Cervical Disc Herniation in a Patient with Churg-Strauss Syndrome: A Case Report

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Abstract

Churg-Strauss syndrome (CSS) or allergic granulomatosis is a necrotizing vasculitis with different presentations. In this case highlights the anesthetic management of a known case of CSS who underwent posterior spinal fixation surgery. Our patient fulfilled the ACR diagnosis criteria because of showing asthma, paranasal sinusitis, positive skin biopsy and eosinophilia. Before anesthesia induction, laryngeal nerves block by lidocaine was conducted. Fiber-optic bronchoscopy was preceded by inserting a No. 7.5 spiral cuffed endotracheal tube.

Keywords: Churg- Strauss Syndrome; Anesthetic Management; Cervical Disc Herniation

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Introduction

Churg-Strauss syndrome (CSS) or allergic granulomatosis is a necrotizing vasculitis that causes multi-organ damages such as sinusitis, nasal polyps, pulmonary infiltrations, degenerative interstitial lung disease, cutaneous nodules and rashes, glomerulonephritis, coronary vasculitis, endocarditis, congestive heart failure, optic neuritis, subarachnoid hemorrhage, cerebral infarcts, asthma and vertebral schwannoma (1-4). Jacobe Churg and Lotte Strauss identified CSS at 1951. Diagnosis of CSS involves clinical symptoms along with pathologic findings in biopsy (1). CSS is an uncommon coexisting disease and could be a challenge for anesthesiologists (5-9). Following case highlights the anesthetic management of a known case of CSS who underwent posterior spinal fixation surgery.

Case Report

A 70 kg, 60-year man admitted in Loghman

Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran, which complained of radicular pain in hands and reduction of muscular force with diagnosis of cervical disc herniation requiring laminectomy. He has suffered from CSS for 14 years. His presentations include asthma and recurrent sinusitis. He has been treated with bronchodilator (Salmeterol 2puffs every 12 hours) since diagnosis. Sinusitis was treated using co-amoxiclav 625mg every 8 hours for one month. On admission, symptoms were controlled. Preoperative assessments showed he was stable and conscious. Lungs were clear, and there was no evidence of productive cough.

Pulmonary function test (PFT) result was normal, Chest X-Ray showed evidence of mild pleural effusion (PE) in the right side. Echocardiography reported ejection fraction (EF)=55% and mild aortic insufficiency (AI), no evidence of cardiomyopathy was present. Cardiac consult evaluated the operation as moderate risk. Electrocardiogram showed normal sinus rhythm and rate. Preoperative laboratory data were in normal range.

Patient drug history was as follow: Azathioprine 75mg/day, Alendronate 40mg/week, Omeprazole 40mg/day, Serotide spray, Gabapentin 100mg/day, Prednisolone 10mg/day.

For the purpose of operation preparation, in preoperation visit, it ordered to continue drugs until to operation day. In the morning of surgery, usual dose of prednisolone and 4 puffs of salbutamol inhalation were administered to the patient.

Before anesthesia induction, anterior part of cervical collar removed whilst neck stabilization by posterior part of collar assured, laryngeal nerves block by lidocaine conducted. Fiber-optic bronchoscopy preceded by inserting a No. 7.5 spiral cuffed endotracheal tube. After confirming placement of the tube by capnography (ETCO₂), it fixed by adhesive tapes. Here upon, anesthesia induced using propofol 140 mg, fentanyl 150 µg, and lidocaine 100 mg. We used 6mg of cisatracurium as the muscle relaxant. In order to monitor blood pressure during operation, arterial line catheter placed. The patient connected to anesthetic machine, the anterior part of cervical collar fixed, and the patient position changed to prone with proper considerations.

During operation, anesthesia maintained with 1.2% isoflurane and intravenous remifentanil infusion 0.3µg/ kg /min. Primary arterial blood gas (ABG) analysis was in normal range. During 2.5 hours of the operation, 2mg cisatracurium injected for the relaxation purpose twice. At the end of the surgical procedure, the patient turned back to the supine position and remifentanil infusion ceased. Combination of neostigmine 4 mg and atropine 1.5 mg was administered to reverse remaining muscle relaxant effects, when the patient regained efficient spontaneous volume and rate of breathing.

Discussion

CSS is an important fibrinoid necrotizing inflammatory leukocytoclastic systemic small-vessel vasculitis that is associated with perinuclear pattern ANCA (10, 11).

Pathophysiology of CSS is not well understood, particularly triggering circumstances (12). In their original description of ANCA, Daives and associates suggested that arbovirus infection-related superantigens might stimulate the production of

ANCA because of molecular mimicry or some other abnormality of immune tolerance. Triggering of these vasculitides by infection has remained a pathophysiological consideration (13).

Cytokines undoubtedly participate in this autoimmune process. Patients with CSS have markedly increased serum levels of interferon alpha and interleukin two (IL-2) and moderate increases of tumour necrosis factor alpha (TNF-α) and IL-1β similar to those observed in polyarthritis nodosa (PAN). Elevations of serum IL-6 concentrations have been shown to precede a rise in serum rheumatoid factors that may accompany the onset of an exacerbation of CSS. Thus, IL-6 may be an important triggering factor. The rheumatoid factors are chiefly of IgG and immunoglobulin M (IgM) classes, rather than immunoglobulin A (IgA) or IgE (14).

The American college of rheumatology (ACR), offered 6 criteria that the patient should have at least 4 of them for CSS diagnosis with the sensitivity of 85% and specificity of 99.7%; including; asthma, eosinophilia, mononeuropathy, pulmonary infiltration in chest X ray, paranasal sinus abnormalities and a biopsy containing a blood vessel with extravascular eosinophils (15).

Our patient fulfilled ACR diagnosis criteria because of showed asthma, paranasal sinusitis, positive skin biopsy and eosinophilia. Most patients with CSS have asthma; therefore, pulmonary function tests (PFTs) are essential in preoperative evaluation. In our case, the PFT (as described above) was not severely affected by asthma.

Patients with CSS usually taking corticosteroid in their medication, therefore it is important for anesthesiologists to manage corticosteroid level of CSS patients to compensate potential adrenal insufficiency (16). The patient took 10mg oral prednisolone per day, hence additional usage supplemental corticosteroids did not need.

We also used propofol for induction because its benefits in asthmatic patients due to its bronchodilation effects.

Volatile anesthetics possess bronchodilatory effects airway responsiveness and attenuate histamine-mediated bronchospasm. The mechanism is thought to be β-adrenergic receptor stimulation leading to increased cyclic adenosine mono phosphate (cAMP).

Increased cAMP may bind free calcium within bronchial myoplasmand cause relaxation by negative feedback. All these confirmed the beneficial effects of volatiles for the maintenance of anesthesia in the patients with hyperreactive airway. Desflurane is an exception, which leads to increased secretions, coughing, laryngospasm and bronchospasm, unlike the other ones. On the other hand analysis of the respiratory mechanics and lung histology in rats which anesthetized with sevoflurane showed evoked stiffness of lung tissue and increased mechanical inhomogeneity (17). Takala et al. measured pulmonary inflammatory mediators in bronchoalveolar lavage fluid after sevoflurane anesthesia in pigs and reported that sevoflurane increased pulmonary leukotriene C₄, NO₃⁻ and NO₂ production that leads to inflammatory response (18).

Conclusion

Churg-Strauss syndrome mandates an experienced and skilled team working together with appropriate devices in the perioperative period; if the airway management is going to be successful.

Acknowledgment

None.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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