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Case Report

Anaesthetic management in a parturient with Takayasu arteritis

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KEYWORDS

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Abstract We report the anaesthetic management of a parturient suffering from Takayasu's arteritis scheduled for elective caesarean section. A full term 29-year-old female weighing 50 kg, height 152 cm, gravida3, para 1 with previous lower segment caesarean section (LSCS) was scheduled for elective LSCS. Patient had suffered a right sided frontoparietal infarct 14 years back for which she underwent treatment in the form of medication from some higher centre She was advised tablet aspirin 75 mg and prednisolone 40 mg once a day. Digital subtraction angiography showed complete occlusion of origin of both subclavian and carotids and reformation of collaterals. Echocardiography revealed mild concentric left ventricular hypertrophy, trivial AR and normal left ventricular systolic function. Caesarean section was planned under regional anaesthesia with monitoring gadgets placed on lower limb. Subarachnoid block (SAB) was administered with 7.5 mg hyperbaric bupivacaine along with 25 μg fentanyl at lumbar 4–5 interspace, using a 25-G Quincke Babcock needle. Intra-operative period was uneventful with minimal fall in blood pressure which was managed accordingly. Parturient was stable in the postoperative period and was moved to a ward after being monitored for 24 h in ICU.

1. Introduction

Takayasu's arteritis (TA) is a chronic progressive vasculitis of unknown etiology that has specific predilection for young women [1]. It affects the aorta and its branches, leading to stenosis, thrombosis and the formation of aneurysms. Hence it is also called as aortic arch syndrome, pulseless disease or occlusive thromboaortopathy. It predominantly affects women of reproductive age. We report the anaesthetic management of a parturient having Takayasu's arteritis scheduled for elective caesarean section.

2. Case report

A full term 29-year-old female weighing 50 kg, height 152 cm, gravida 3, para 1 with previous lower segment caesarean section (LSCS) was scheduled for elective LSCS. She was a

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diagnosed case of Takayasu's disease. Patient had suffered a right sided frontoparietal infarct 14 years back for which she underwent treatment in the form of medication from some higher centre She was advised tablet aspirin 75 mg and prednisolone 40 mg once a day. Presently she fully recovered from the problem except for a residual weakness in both limbs on left side (power grade 4). Preoperative investigations revealed haemoglobin to be 11 gm%, platelet count 180,000/mm^3, INR 1.2, blood urea to be 34 mg%, blood sugar 88 mg%, serum sodium 148 mg%, and serum potassium 4.5 mg%. Digital subtraction angiography showed complete occlusion of origin of both subclavian and carotids and reformation of collaterals. Echocardiography revealed mild concentric left ventricular hypertrophy, trivial AR and normal left ventricular systolic function. She continued with medications during her first pregnancy and baby was born vaginally at 34 weeks of gestation with gross congenital malformations incompatible with life and died immediately after birth. During her 2nd pregnancy she stopped taking medications herself after first trimester. She was put on aspirin 75 mg during 9th month and underwent an uneventful elective LSCS under spinal anaesthesia elsewhere, records of which were not available. After LSCS she started taking prednisolone as well as aspirin regularly. During her present pregnancy she stopped taking medicines again from the 1st week of gestation. At term she reported to our centre for delivery as our institution is a tertiary care and referral centre catering to the needs of the people of Northern India. On pre-anaesthetic assessment the patient was alert and oriented. Physical examination revealed absent bilateral radial, ulnar, brachial, axillary, subclavian and carotid artery pulsations but peripheral pulsations were normally felt in both the lower limbs. The patient's heart rate was 76 beats/min. Arterial blood pressure measured in lower limb was 160/90 mm Hg (MAP 110 mm Hg). The patient's respiratory rate and room air O2 saturation was 14/min and 98% respectively. Neurological examinations showed residual weakness in left lower limb.

On the patient's arrival in the operating room, all the monitoring devices were placed, including five lead continuous electrocardiography, O2 saturation of arterial blood was monitored by placing pulse oximeter probe on the rigft big toe, non-invasive blood pressure cuff over the left thigh. Baseline arterial pressure, heart rate, respiratory rate and room air O2 saturation were 140/90 mm Hg, 84 beats/min, 14 min and 98%, respectively. Intravenous access was secured with a 18-G cannula on dorsum of right hand. Inj hydrocortisone 100 mg was administered intravenously and preloading (20 ml/kg) was done using Ringer's lactate solution. Under strict asepsis, subarachnoid block (SAB) was administered with 7.5 mg hyperbaric bupivacaine along with 25 μg fentanyl at lumbar [4,5] interspace, using a 25-G Quincke Babcock needle. While positioning (left lateral) for SAB, flexion of the neck was avoided. The patient was then placed supine and oxygen (5 l/min) was administered via a face mask. A pillow was placed under the patient's head, and 15° left lateral tilt was maintained by applying a wedge. After the administration of SAB, a transient fall in the patient's blood pressure (128/78 mm Hg [MAP 94 mm Hg]) occurred which responded to 250 ml of balanced salt solution and inj ephedrine 3 mg in increments. The MAP was corrected to 100 mm Hg. Following the delivery of the baby, oxytocin infusion was started (20 units in 500 ml of crystalloid at a rate of 8–10 drops/min). No further fall of the MAP was noted and the rest of the procedure was uneventful. The Parturient was stable in the postoperative period and was moved to a ward after being monitored for 24 h in ICU.

Injection hydrocortisone 50 mg every eight hours was administered intravenously for the first two postoperative days, followed by 10 mg oral prednisolone twice daily. Her further stay in the hospital was uneventful. The patient was discharged home on the tenth postoperative day.

3. Discussion

Takayasu's disease was first described in 1908 by two Japanese ophthalmologists, Takayasu and Onishi, who observed retinopathy occurring with absent limb pulses. It is recognized as a rare (2–3 per million) [2] granulomatous vasculitis of the aorta and its major branches and the pulmonary arteries [3,4]. Takayasu disease appears to be more common in persons of Asian ethnic origin although it has a worldwide occurrence [5]. In Japan an autopsy survey suggested a frequency of 1 in 3000 persons [6]. In an American study incidence of Takayasu disease was found to be 2.6 new cases/million/year [7]. Its incidence in Indian population is not known. It is more common in women than men (8:1) with the peak incidence in the second and third decades, although a substantial minority, including this patient may present in their teens. The exact etiology remains unknown but it may have an autoimmune basis. Because it is more prevalent in women of childbearing age, sex hormones may be involved in the pathogenesis [8]. It has been classified on the basis of distribution of affected vessels [9,10]. Type I involves the aortic arch and its main branches. Lesions in Type II are restricted to the descending thoracic and abdominal aorta. Patients with Type III show features of both Types I and II, and patients with Type IV show additional involvement of the pulmonary artery. Our patient was categorised as Type I, with involvement of the carotids and the brachiocephalic trunk.

Anaesthesiologist may encounter these patients during obstetrical anaesthesia, incidental surgery or corrective vascular procedures. Clinically the patient presents with absence of various pulses in the upper half of the body. Anaesthesia in patients with TA can be associated with severe uncontrolled hypertension leading to end-organ dysfunction and stenosis of major blood vessels affecting regional circulation.

Ishikawa and Matsuura [11] studied 27 Japanese women with Takayasu arteritis associated with 33 pregnancies and observed that the degree of severity of retinopathy, secondary hypertension, aortic regurgitation and arterial aneurysm were particularly significant indicators of maternal outcome. He classified patients into four groups. Group I had none of the above complications, group IIa had one complication of mild severity, group IIb had one complication of marked severity and those with two or more complications were allocated to group III. Our patient was largely asymptomatic (apart from headaches) throughout her pregnancy. This may have been because of treatment with steroids since her early presentation of symptoms which could have induced a remission and significantly limited her disease. Although the effect of pregnancy, labour and delivery is not known to alter disease activity, a substantial number of patients have worsening of complications, particularly cardiac decompensation [12]. Fortunately, that did not occur in our patient.

Vaginal delivery, usually with epidural anaesthesia, is acceptable for patients in groups I and IIa, although the duration of the second stage is often deliberately shortened by instrumental delivery, particularly in hypertensive patients [13]. Operative delivery is preferred for patients with stages IIb or III but is reserved for specific obstetric indications in less severely affected individuals. Its aim is to avoid the increase in blood volume and arterial pressure found during uterine contractions. In association with the increased cardiac output normally seen during pregnancy and labour, the likelihood of cardiac decompensation is increased further and is best avoided in these susceptible individuals.

The main concern in conduction of anaesthesia in patients with TA is the maintenance of blood pressure during the perioperative period. There are advantages and disadvantages of both general and regional anaesthesia. General anaesthesia involving endotracheal intubation, extubation and inadequate depth may result in considerable fluctuations in blood pressure and may precipitate cerebral haemorrhage, rupture of aneurysms and cardiac dysfunction in patients with TA. Regional anaesthesia may be advantageous as cerebral function in conscious patients is easy to monitor [14–16]. However, it may be associated with hypotension. Previous reports of anaesthetic management have emphasised the importance and difficulties of adequate cardiovascular monitoring. In our case invasive monitoring was deemed unnecessary taking into account the minor nature of the scheduled surgical procedure and the fact that that arterial blood pressure could be monitored using automated noninvasive blood pressure monitor in the right lower limb. Hung et al. [17] assessed central system blood pressures in a patient with Takayasu syndrome and found that aortic systolic and diastolic pressures were 100 to 120 mm Hg over and above those obtained in the upper limbs peripherally. However a moderate degree of correlation was observed between the central blood pressures and those obtained peripherally in the lower extremities by oscillometer or doppler method. Therefore we used noninvasive automated blood pressure monitoring based on the oscillometery principle.

The MAP in these patients should be maintained within 20% of the preoperative values. We preloaded the patients with 20 ml/kg of Ringer's lactate as these patients may not tolerate acute hypotension. This is because diffuse arteritis result in stenotic and non-compliant vessels, which interfere with compensatory mechanisms to increase blood pressure [16]. A pillow was placed under the patient's head to prevent any extension of the neck, which may reduce the carotid blood flow by stretching the arteries, and a left lateral tilt was maintained to prevent aortocaval compression.

In conclusion, we recommend meticulous preoperative evaluation of these patients before taking up for surgery. Proper intraoperative planning is necessary for sucessful management of such cases.The choice of the anaesthesia technique in a parturient having TA should be tailored to the presentation of patients. SAB using low dose local anaesthetic and adequate preloading can be safely performed in patients with TA. The maintenance of mean arterial pressure close to preoperative value should be a goal to achieve favourable outcome.

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