



## Surgery in Patient with Takayasu Arteritis: A Challenge for Anaesthesiologists

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### Abstract

This case report describes successful anesthetic management of a known case of takayasu arteritis patient presented for lower segment caesarean section. On her angiography, there was narrowing of common carotid artery at origin and non visualization of left subclavian artery. She had a bad obstetric history. Her thorough pre operative evaluation was done. She was successfully anaesthetized with low dose spinal anesthesia with 7.5 milligram injection bupivacaine and 25 micrograms injection fentanyl. Epidural catheter was inserted for post operative analgesia. Her intra-operative and post-operative period was uneventful. In these cases, if blood pressure is well maintained, low dose spinal anesthesia with epidural remains a good option. This allows the patient to remain awake and thus allows monitoring of brain perfusion which is particularly important in patients with stenosed carotid arteries.

**Keywords:-** Takayasu arteritis, Regional anesthesia, Low dose spinal anesthesia, Caesarean section.

### INTRODUCTION

Takayasu arteritis is a chronic, inflammatory, progressive and idiopathic granulomatous panendarteritis involving aorta and its branches with specific predilection for young women in reproductive age group.<sup>[1,2]</sup> The course of disease is unaltered in pregnancy but patients may develop complications like hypertension, multi-organ dysfunction and intrauterine growth retardation.<sup>[3,4]</sup> This case report summarizes a successful anesthetic management of a patient with takayasu arteritis undergoing elective lower segment caesarean section.

### CASE REPORT

A 21 year old G3P1+1 alive 0 diagnosed with takayasu arteritis presented at period of

gestation 34 weeks + 6 days. She had previous history of two intrauterine deaths. She had a history of hypertension and claudication in left arm. She was on regular antihypertensive therapy with tablet labetalol 100 mg and tablet amlodipine 5 mg. Her pulses on left upper limbs were feeble but normal on right side. Lower limb pulses were normal with good volume.

Her angiography showed slightly prominent ascending aorta without any aneurysmal dilatation, narrowing of common carotid artery at origin and non visualization of left subclavian artery. On echocardiography, left ventricular ejection fraction was 56% with concentric left ventricular hypertrophy and normal LV/RV functions. Her cardiac catheterization study showed peripheral artery

disease with total occlusion of left subclavian artery at its origin and left subclavian artery was filling retrograde through grade 3 collaterals from left vertebral artery with left renal artery stenosis. On ultrasonographic examination of the abdomen, there was mild intra uterine growth retardation with absent end diastolic flow. On examination her left radial, brachial and carotid pulses were feeble while right radial, brachial and carotid pulses were normal and her pulse rate was 96 beats per minute. Bilateral femoral and dorsalis pedis were felt normally and the pulse rate was 96 beats per minute. Her blood pressure, in right arm was 166/118 mm of Hg, in left arm was 164/114 mm of Hg, in right leg was 165/97mm of Hg and in left leg was 178/103 mm of Hg. Blood pressure was monitored in both upper and lower limbs as these patients usually have lower blood pressure in upper limbs than in lower limbs. Her blood investigations were within normal limits with hemoglobin 11.7g%. Her airway was graded as MPS class 2, and was taken for anesthesia. Because of IUGR and bad obstetric history, she was posted for elective lower segment caesarean section at gestational age of 34weeks +6 days.

### Anesthetic management

The patient was pre-medicated with injection ranitidine and injection metoclopramide intravenously. Monitoring included five lead electrocardiography, pulse oximetry, respiratory rate monitoring and noninvasive blood pressure monitoring in right upper limb. Noninvasive method of blood pressure monitoring was used to avoid inflicting trauma during arterial cannulation to the already diseased vessels. Intravenous line was secured

with 18 G cannula. Patient's preoperative vitals included heart rate- 86 beats/min, blood pressure - 168/104 mm of Hg, oxygen saturation- 96% on room air and respiratory rate- 15/min. Injection hydrocortisone 100 mg was given intravenously and patient was planned under low dose spinal and controlled epidural anesthesia. Under all aseptic precautions, epidural catheter was inserted in L3- L4 epidural space. This was followed by subarachnoid block at L3- L4 space with low dose injection of 0.5% heavy bupivacaine 1.25ml (7.5mg) and 25 micrograms fentanyl. Surgery was allowed once the dermatomal level of anesthesia was found to be T6. Oxygen inhalation was started via venturimask with FiO<sub>2</sub>- 24%. Injection Oxytocin 10 IU was given in 500 ml ringer lactate after delivery of baby. Injection ephedrine 3mg was given intravenously to maintain the blood pressure. Two vacs of ringer lactate were given intravenously. Patient's urine output was 150ml and approximate blood loss was 600ml. Intraoperative vitals remained in the range of heart rate- 70-114/min, blood pressure- 144-100/90-74 of Hg, oxygen saturation- 99-100% and respiratory rate was 16-18/min.

### DISCUSSION

Takayasu arteritis was first described in 1908 by two Japanese ophthalmologists Takayasu and Onishi and the term was coined in 1939.<sup>[2,5,6]</sup> In this disease, there is lymphocytic and other inflammatory cell infiltration in the intima of the blood vessels, which results in loss of elastic tissue and is replaced by fibrous tissue resulting in vascular occlusion, stenosis, dilatation and aneurysm formation.<sup>[7,8]</sup> Ishikawa classified Takayasu arteritis into four

groups. Group I includes patients with no complications, group II a includes patients with one mild complication, group II b includes patients having one complication with marked severity and group III includes patients having two or more complications. In group I and II a, vaginal delivery under epidural analgesia is acceptable with shortened second stage of labour with forceps application.<sup>[9]</sup> In group II b and III, operative delivery is preferred but is reserved for specific obstetric indications in less severely affected individuals.<sup>[10]</sup>

This surgery can be performed under both regional and general anaesthesia. One of the advantages of regional anaesthesia is that the patient remain awake during the surgery and this allows monitoring of brain perfusion through the patient's level of consciousness.<sup>[11,12]</sup> Other advantages of regional anaesthesia includes the smooth control of blood pressure (no hypertensive response due to intubation), minimal fetal exposure to drugs, no risk of aspiration, no risk of failed intubation or ventilation, less blood loss, better neuro-behavioural score of fetus at birth and analgesia can be extended to postoperative period as well. There is one disadvantage in regional anaesthesia that it can cause sympathetic blockage and hypotension which is hazardous in such patients if blood pressure is not well maintained. When general anaesthesia is used, it avoids sympathetic blockage and hypotension.<sup>[13]</sup>

This case was managed under low dose subarachnoid block. Epidural catheter was also inserted which would have prevented from forced conversion to general anaesthesia in situation of inadequate block or in case of

prolonged surgery. Epidural catheter provide post operative analgesia which will prevent hypertension and tachycardia in post operative period.

In these cases meticulous preoperative assessment is required to anticipate the difficulty and to prepare for that accordingly. Blood pressure of all four limbs should be recorded. Noninvasive blood pressure monitoring should be applied in the arm with palpable pulses. Invasive arterial pressure monitoring should be avoided as the vessels are already diseased and it can cause further trauma.<sup>[7,12]</sup>

Hydrocortisone 100 mg was instituted before surgery prophylactically to prevent occurrence of Addisonian hypotensive crisis. A small ring was placed under patient's head to prevent neck extension as the carotid artery is narrowed and neck extension can further impede cerebral blood flow.<sup>[14]</sup> Blood pressure and fluid status should be maintained.<sup>[12]</sup> After subarachnoid block, ephedrine was given to maintain blood pressure within normal range. These cases were also managed successfully under general anaesthesia,<sup>[3]</sup> epidural anaesthesia,<sup>[15]</sup> combined spinal epidural anaesthesia and with low dose spinal with epidural volume extension technique.<sup>[16,17]</sup>

## CONCLUSIONS

Low dose spinal with epidural is good option in patients with Takayasu arteritis if blood pressure is effectively maintained within normal range.



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