

## Epidural Anaesthesia For Emergency Cesarean Section In Patient With Takayasu Arteritis – Case Report

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### ABSTRACT

**Background:** Takayasu's arteritis (TA) is a granulomatous disease which is progressive in nature. This disorder is an inflammatory vasculitis which affects mainly aorta and its branches resulting in end-organ dysfunction , stenosis of main blood vessels and also in monitoring of blood pressure during anaesthesia. The advantage of Regional anesthesia over General anesthesia include an attenuation of sympathetic – mediated increase in HR and CO and minimal alteration in hemodynamics. This case report briefs about the how epidural anaesthesia was successfully employed for cesarean section in a women with chronic untreated Takayasu arteritis.

**Case report:** A 31 year old female who is a known case of untreated Takayasu arteritis with no complications came with active labor pain who was posted for cesarean section. Local anesthetic was administered in fractioned doses to achieve the slow installation of blockade. The patient was hemodynamically stable after which she was transferred to intensive care unit during the postoperative period..

**Conclusion:** Numerous complications may arise in gravidas with TA, necessitating meticulous patient assessment, management of TA-related complications, and anesthetic-surgical planning. Ensuring adequate perfusion is paramount, and neuraxial blocks can be administered safely; thus, patients should be observed in intensive or special care unit for 24 hours to prevent postoperative complications.

**Keywords:** Takayasu arteritis, gravid, epidural anesthesia,

### INTRODUCTION

Takayasu Arteritis (TA) is a chronic and progressive inflammatory condition of unknown origin that results in the narrowing, obstruction, and formation of aneurysms in systemic and pulmonary arteries, primarily impacting the aorta and also its branches. (1,2) The etiology remains unidentified; however, it appears to be associated with autoimmune processes, hormonal factors (notably more prevalent in younger females),

and genetic predispositions, as evidenced by the association with the human leukocyte antigen – HLA BW52.(3) Four distinct classifications of Takayasu Arteritis can be delineated as follows. Type I is characterized by involvement of the arch of aorta and its branches. Type II lesions are limited to the descending thoracic aorta and abdominal aorta. In Type III, the patients will be exhibiting the features of both types I as well as type II. In Type IV, there is involvement of the pulmonary artery. (4) In addition, the disease may be categorized into following stages based on the occurrence of significant complications such as aneurysms, retinopathy and aortic insufficiency. Stage I indicates the absence of complications; stage IIa signifies the presence of a single complication; stage IIb refers to a single complication in its severe form; and stage III denotes the presence of multiple complications.(5) Diagnosis depends on the clinical signs and symptoms, inflammatory biomarkers, and arteriography showing the aortic stenosis and involvement of its branches. Nevertheless, the definitive method for diagnosis remains the biopsy of the affected vessel.(6)

This condition predominantly impacts females within their reproductive years, constituting nearly 80% of reported instances. The progression of the illness remains unaffected during gestation; nonetheless, it is imperative to exercise caution regarding the peripartum management of these individuals, as they may experience complications such as hypertension, multiple organ failure, and stenosis which hinders the regional blood flow. Hence careful monitoring of blood pressure and addressing restricted intrauterine growth is important.(7,8) The issue of anesthesia in Takayasu arteritis (TA) is complex, primarily attributable to the condition's effects on vascular stability and hemodynamic parameters. Typically, regional anesthesia is favored for cesarean delivery since the increased blood volume and also the blood pressure along with the elevated cardiac output because of uterine contractions during the labor can cause cardiac decompensation (9) The management of anesthesia is further complicated by severe hypertension, end-organ dysfunction, and vascular stenosis, all of which contribute to considerable perioperative risks. A comprehensive understanding of these challenges is essential for proficient anesthetic strategy formulation. (10) The benefits of regional anesthesia compared to general anesthesia encompass a reduction in sympathetic-mediated heart rate and cardiac output elevations, coupled with minimal hemodynamic alterations.(11) Herein, we present a case study of a primigravida patient with untreated chronic Takayasu disease who successfully underwent a cesarean section utilizing epidural anesthesia..

## CASE HISTORY

A 30 year old female patient with Obstetric score of G3 P1 L1 D1 with 32 weeks of gestation diagnosed with Takayasu arteritis (TA) came with complaints of pain for the past 2 days in the lower abdomen, which was intermittent in nature and got relieved by taking rest with no radiating feature. She gave history of swelling of lower limb upto ankle since 1 week which got relieved by taking rest. She also reported that she had history of giddiness for past 2 months and occasional chest pain for last 1 month. On further enquiring it was found that she had experienced joint pain during her 1<sup>st</sup> pregnancy and also history of two blood transfusions with no transfusion reaction. She also had jaundice at the age of 12. She is a known case of takayasu arteritis for last 8 years diagnosed in 1st pregnancy and didn't took any treatment. She had surgical history of LSCS 8 years back with no anesthetic complications. On clinical examination, she was anemic, cyanosis and pedal edema was present. The patient was moderately built and nourished with a BMI of 21.2 kg/m<sup>2</sup>. No arteries were palpable in upper limb, head and neck. Only dorsalis pedis artery in both lower limbs were palpable with 94-96 bpm. Carotid bruit heard on both the sides. Even Blood pressure was measurable in only lower limbs only of around 110-120/ 60-80 mm Hg.

Preanesthetic evaluation: Airway examination of the patient reveals that there was no facial dysmorphism for the patient, TMJ mobility was normal with Mallampati grade II. Cervical spine mobility was also normal. Patient was assessed clinically for any signs of neck stiffness, orientation, consciousness. All laboratory parameters such as complete blood count, serum electrolytes, random blood glucose, liver function test and renal function test, ESR were found to be in normal limits. The patient also had normal coagulation profile. Patient was started on Tab. prednisolone 20mg BD and INJ. LMWH 40 IU s/c OD. Electro cardiogram showed – Normal sinus rhythm, T wave inversion in lead 3. 2D ECHOCARDIOGRAPHY SHOWED ejection fraction of 58% with trivial Tricuspid regurgitation.

MRI brain with MR angiogram was taken in which it showed following features: Right ICA complete occlusion and Left ICA near total occlusion. Anterior, middle cerebral arteries in both sides were filling through posterior circulation. Right vertebral artery was hypoplastic and left vertebral artery was found to be hypertrophied with normal Basilar artery.

Because of development of sudden fetal distress at gestational age of 35weeks+4-day, patient was shifted to operation theatre for emergency cesarean section. IV access was established in the right forearm with 18G venflon. The patient was preloaded with 500 mL of Ringer's lactate. Standard ASA monitors were connected and Base values were as follows: Pulse rate-110/min, Noninvasive blood pressure-93/65mmhg and Spo2-98 on RA. Monitoring protocols included pulse oximetry on the right upper extremity, non-invasive blood pressure assessment on the left upper extremity, a 5-lead electrocardiogram, and urine output measurement. The selected approach for anesthesia was continuous epidural anesthesia. A graded epidural technique was planned. With the

patient in sitting position, under aseptic precautions, a 16G Tuohy needle was inserted into the L1-L2 intervertebral space utilizing the loss of resistance to saline technique, through which the epidural catheter was introduced with catheter at skin 11cm, and test dose of 2% lignocaine with adrenaline was administered. Supplementary oxygen was given through Hudson mask at 4 L/min. Subsequently, the patient was made supine with the uterus displaced to the left. Incremental doses of 0.5% bupivacaine along with 50 µg of fentanyl were administered via the epidural catheter in a graded manner to ensure gradual onset of the analgesic blockade. A total of 60 mg of bupivacaine was given until sensory blockade was achieved up to the T4 level. The onset time for the blockade was recorded at 20 minutes. Systolic blood pressure measurements varied between 90 to 110 mmHg, with diastolic blood pressure ranging from 60 to 70 mmHg, and heart rate maintained between 60 and 80 bpm without the use of vasopressor agents. A cesarean section was performed and girl infant was delivered within 5 minutes of incision with weight 2.7 kg, APGAR score of 8/10, 9/10. Infusion of 20 units Oxytocin was started post-delivery with which a good uterine muscle tone was attained. Estimated intraoperative blood loss approximated 800 mL, Urine output of 300ml was obtained and a total of 1500ml of crystalloids was infused. Following the surgical intervention, the patient was transferred to the Intensive Care Unit where 0.0625% bupivacaine infusion administration was continued with the epidural catheter for 24 hours to provide postoperative analgesia. Anticoagulation therapy with enoxaparin at a dosage of 60 mg subcutaneously every 12 hours was restarted 24 hours post-cesarean section. The patient was shifted from ICU on the 3<sup>rd</sup> day and got discharged in satisfactory condition on the 8<sup>th</sup> day itself.

## DISCUSSION

Regional anesthesia is favored in Takayasu arteritis as it enhances the evaluation of cerebral perfusion through consciousness assessment. Continuous epidural local anesthetic administration allows for careful titration to maintain hemodynamic stability while reducing vasopressor needs, although one must avoid excessive anesthetic spread that could compromise these advantages. (12-14) Researchers suggest that combined anesthesia may be a feasible alternative; however, it requires increased fluid replacement and vasopressor utilization. (8,15). Previous studies confirm among TA cases, both regional and general anesthesia as combined forms can be successfully done. Mickle and Milne, with their study findings has cautioned the use of spinal anaesthesia since they noticed that there was significant difference in arterial pressures of lower and upper limbs. They also warned that there will be limited regional blood flow in an unpredictable manner because of sympathetic block of epidural anesthesia. But this can be managed by the usage of graded epidural block of anesthesia as done in our study which prevents the vigorous fall in blood pressure and helped lowering the rate of thrombosis. (16) But in general anesthesia though sympatholysis is avoided, strict monitoring of cerebral functions is required since it may cause hypertensive episode which in turn could cause cardiac or cerebral events. In addition with general anesthesia, marked fluctuations in blood pressure can occur due to tracheal intubation, extubation and inadequate depth of anesthesia which also can cause cerebral haemorrhage, cardiac dysfunction and rupture of aneurysms in TA. (17)

In the comprehensive case report conducted by Henderson K and colleagues, it was demonstrated that the implementation of epidural anesthesia was successfully utilized in the context of a cesarean section performed on a patient suffering from severe takayasu arteritis, thereby highlighting the potential efficacy of this anesthetic technique in complex clinical scenarios. (18) Furthermore, a pertinent case study authored by Tiwari AK and associates elucidated that the application of the epidural volume extension technique can yield effective anesthetic management for a female patient diagnosed with takayasu arteritis who required an emergency cesarean section, suggesting that this method may be particularly advantageous in urgent situations. (19) Additionally, the research conducted by Blumgart and colleagues provided compelling evidence that administering an epidural injection of either local anesthetic or saline five minutes subsequent to the administration of spinal anesthesia can significantly enhance analgesic outcomes when compared to the use of spinal anesthesia in isolation. (20) Despite the aforementioned findings, it is noteworthy that there exists a dearth of extensive studies that have conclusively demonstrated that the exclusive use of epidural anesthesia can facilitate a safe cesarean section for women diagnosed with takayasu arteritis, thereby indicating a gap in the current literature. Consequently, it is imperative that further investigation be undertaken to explore and identify the potential complications associated with this anesthetic approach, which could be effectively accomplished through the development and analysis of detailed case series. In light of these considerations, the necessity for additional research becomes increasingly evident, particularly in the context of enhancing clinical guidelines and improving patient outcomes for this specific population. Ultimately, such endeavors will not only contribute to the existing body of knowledge but also serve to inform future clinical practices surrounding anesthetic management in patients with takayasu arteritis undergoing surgical interventions.

## CONCLUSION

Gravidas who present with a condition of Takayasu arteritis may encounter a multitude of complications that can significantly impact their health and the health of their offspring. It is of paramount importance that a thorough evaluation of the patient is conducted, alongside the meticulous management of any complications associated with

TA, in addition to comprehensive anesthetic and surgical planning, which are all critical components of their care. The maintenance of sufficient perfusion during the entirety of the treatment period remains the principal priority for healthcare professionals overseeing the care of these patients. In this regard, the application of neuraxial anesthesia can be executed safely without inflicting harm upon either the mother or the newborn infant; however, further research is advisable for the implementation of regional anesthesia into a standard anesthetic guidelines for managing Takayasu arteritis.

## REFERENCES

1. Beilin Y, Bernstein H – Successful epidural anaesthesia for a patient with Takayasu's arteritis presenting for Caesarean section. Can J Anaesth, 1993;40:64-66. (<https://www.semanticscholar.org/paper/Successful-epidural-anesthesia-for-caesarean-in-a-Mathney-Beilin/793a695d3e6bf356dafaf09977a27ee409c76777/>)
2. Ishikawa K, Matsumura S – Occlusive thromboaropathy (Takayasu's disease) and pregnancy. Clinical course and management of 33 pregnancies and deliveries. Am J Cardiol, 1982;50:1293-1300. (<https://pubmed.ncbi.nlm.nih.gov/6128919/>)
3. Wilke WS – Large vessel vasculitis (giant cell arteritis, Takayasu arteritis). Baillieres Clin Rheumatol, 1997;11:285-313. (<https://pubmed.ncbi.nlm.nih.gov/9220079/>)
4. Lupi-Herrera E, Sanchez-Torres G, Marcushamer J et al. – Takayasu's arteritis. Clinical study of 107 cases. Am Heart J, 1977;93:94-103. (<https://europepmc.org/article/MED/12655>)
5. Ishikawa K – Natural history and classification of occlusive thromboaropathy (Takayasu's disease). Circulation, 1978;57:27-35. (<https://pubmed.ncbi.nlm.nih.gov/21760/>)
6. Kerr GS, Hallahan CW, Giordano J et al. – Takayasu arteritis. Ann Intern Med, 1994;120:919-929. (<https://pubmed.ncbi.nlm.nih.gov/7909656/>)
7. Ioscovich A, Gislason R, Fadeev A et al. – Peripartum anesthetic management of patients with Takayasu's arteritis: case series and review. Int J Obstet Anesth, 2008;17:358-364. (<https://pubmed.ncbi.nlm.nih.gov/18691876/>)
8. Kathirvel S, Chavan S, Arya VK et al. – Anesthetic management of patients with Takayasu's arteritis: a case series and review. Anesth Analg, 2001;93:60-65. (<https://pubmed.ncbi.nlm.nih.gov/11429340/>)
9. Wong VC, Wang RY, Tse TF – Pregnancy and Takayasu's disease. Am J Med, 1983;75: 597-601. ([https://sci-hub.se/10.1016/0002-9343\(83\)90439-4](https://sci-hub.se/10.1016/0002-9343(83)90439-4))
10. Henderson K, Fludder P – Epidural anaesthesia for caesarean section in a patient with severe Takayasu's disease. Br J Anaesth, 1999;83:956-959. (<https://pubmed.ncbi.nlm.nih.gov/10700801/>)
11. Leal PD, Silveira FF, Sadatsune EJ, Clivatti J, Yamashita AM. Takayasu's arteritis in pregnancy: case report and literature review. Revista Brasileira de Anestesiologia. 2011;61:482-5. (<https://pubmed.ncbi.nlm.nih.gov/21724011/>)
12. Bharuthram N, Tikly M. Pregnancy and Takayasu arteritis: case-based review. Rheumatology International. 2020 May;40(5):799-809. (<https://pubmed.ncbi.nlm.nih.gov/31858208/>)
13. Choi DH, Kim JA, Chung IS – Comparison of combined spinal epidural anesthesia and epidural anesthesia for caesarean section. Acta Anaesthesiol Scand, 2000;44:214-219. (<https://pubmed.ncbi.nlm.nih.gov/10695917/>)
14. Banerjee A, Stocche RM, Angle P et al. – Preload or coload for spinal anesthesia for elective Cesarean delivery: a meta-analysis. Can J Anaesth, 2009;57:24-31. (<https://pubmed.ncbi.nlm.nih.gov/19859776/>)
15. Hauth JC, Cunningham FG, Young BK – Takayasu's syndrome in pregnancy. Obstet Gynecol, 1977;50:373-375. (<https://pubmed.ncbi.nlm.nih.gov/19719/>)
16. Meikle A, Milne B. Extreme arterial blood pressure differentials in a patient with Takayasu's arteritis. Can J Anaesth 1997; 44: 868-71. (<https://pubmed.ncbi.nlm.nih.gov/9260014/>)
17. Archana Sharma, Nilay A Mangrulkar. Takayasu's Arteritis: Anaesthetic Implications And Management Of A Patient For Cesarean Section In A Tertiary Care Hospital. Volume - 12, Issue - 04, April - 2023 • Print Issn No. 2277 - 8160 • Doi : 10.36106/Gjra (<https://pubmed.ncbi.nlm.nih.gov/11429340/>)
18. Henderson K, Fludder P. Epidural anaesthesia for caesarean section in a patient with severe Takayasu's disease. British journal of anaesthesia. 1999 Dec 1;83(6):956-9. (<https://pubmed.ncbi.nlm.nih.gov/10700801/>)
19. Tiwari AK, Tomar GS, Chadha M, Kapoor MC. Takayasu's arteritis: Anesthetic significance and management of a patient for cesarean section using the epidural volume extension technique. Anesthesia Essays and Researches. 2011 Jan 1;5(1):98-101. (<https://pmc.ncbi.nlm.nih.gov/articles/PMC4173377/>)
20. Blumgart CH, Ryall D, Dennison B, Thompson-Hill LM. Mechanism of extension of spinal anesthesia by extradural injection of local anaesthetic. Br J Anaesth. 1992;69:457-60. doi: 10.1093/bja/69.5.457. (<https://pubmed.ncbi.nlm.nih.gov/1467075/>)