

Low Dose Spinal Anaesthesia for a Pediatric Patient with Takayasu's Arteritis Undergoing Orthopaedic Surgery: a case Report

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Abstract

Takayasu's arteritis (TAK) is an arteritis, often granulomatous, predominantly affecting the aorta, its major branches and the pulmonary arteries. Onset usually occurs before the age of 50 years usually second or third decade. TAK is one of the more common etiologies of renovascular hypertension in pediatric age group. Anaesthesia in patients with TAK is complicated with severe uncontrolled hypertension leading to end organ dysfunction, stenosis of major blood vessels affecting regional circulation, and difficulties in monitoring blood pressure. Although spinal anaesthesia is widely using in pediatric age group, we have not seen any report concerning spinal anaesthesia for pediatric patient with TAK. We present a case of successful low dose spinal anaesthesia management of a pediatric patient with TAK, who underwent core decompression operation by orthopedia clinic

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Introduction

Takayasu's arteritis (TAK) is arteritis, often granulomatous, predominantly affecting the aorta, its major branches and the pulmonary arteries. Clinical symptoms occur as a consequence of progressive obliteration of the lumina of the aorta and its main branches, the pulmonary arteries, or both, resulting in intermittent ischaemic episodes. TAK is one of the more common etiologies of renovascular hypertension in pediatric age group. Major cause of hypertension is renovascular, but it can also result from an abnormal function of the carotid and aortic sinus baroreceptors and reduced elasticity, and a marked narrowing of the aorta and major arteries [1-3]. In Japan, 20% of cases were found in patients aged less than 19 and just 2% in children aged less than 10 years. Congestive heart failure is associated with arterial hypertension, myocarditis, pericarditis, pulmonary hypertension, and aortic insufficiency. Aortic insufficiency affects 7-55% of patients with TAK [4]. Anaesthesia in patients with TAK is complicated with severe uncontrolled hypertension leading to end organ dysfunction, stenosis of major blood vessels affecting regional circulation, and difficulties in monitoring blood pressure. Although spinal anaesthesia is widely using in pediatric age group we have not seen any report concerning spinal anaesthesia for pediatric age with TAK.

Case

She was a 14 years old, 160 cm height and 50 kg girl. She had aortic surgery (aortic aneurysm) when she was 3 year old. Growth hormone deficiency was detected 3 years ago and had been used somatropin (Norditropin^R). She was diagnosed with TAK two years ago. Core decompression operation planned by orthopaedia clinic for left femoral supracondyler avascular necrosis. Preoperative examination of the patient including haemogram, renal and liver function tests, coagulation profile were in normal limits. Electrocardiogram revealed normal sinus rhythm and long QT, QTc interval was 0.37s. Echocardiography revealed grade 1 mitral and aortic regurgitation and hypertrophic left ventricle. The patient complained of dizziness. In MR angiography segmental narrowing was detected in left artery carotid communis (Figure 1) and in catheter angiography 2-3 cm middle and severe segmental narrowing was detected in proximal left arteria carotis communis. In the operation room the patient monitorized including ECG, oxygen saturation by pulse oximeter. TAK is also called 'pulseless disease', since peripheral pulses are often absent due to vascular obstruction. We selected right a. dorsalis pedis for invasive arterial monitorization because the lower limb vessels were unaffected in our patient.

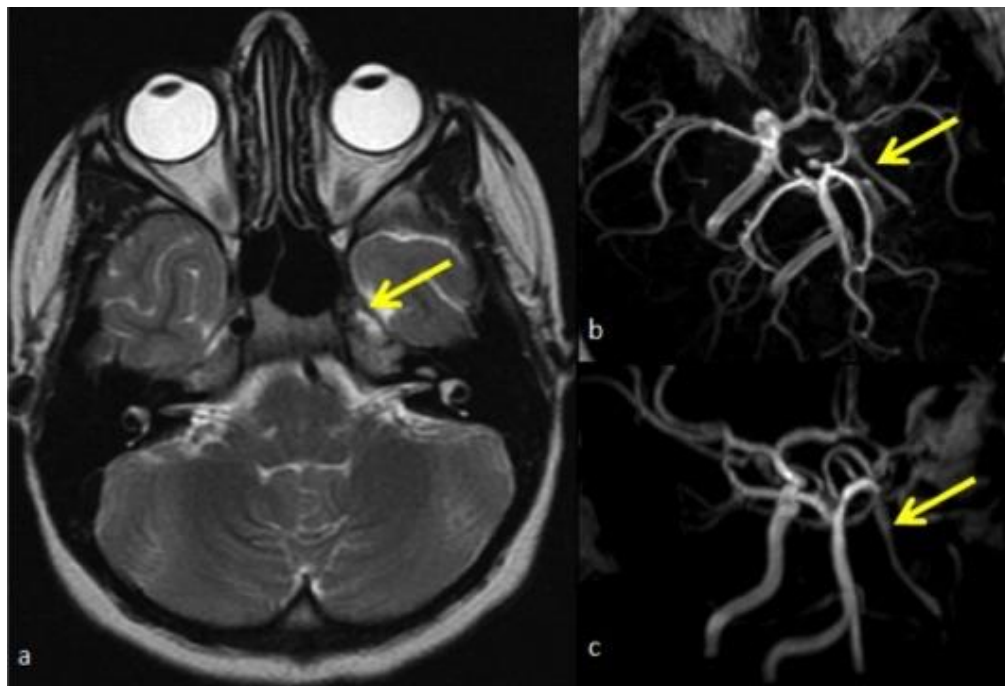


Figure 1. T₂ axiel (a) Time of Flight (TOF) MR Angyography maximum intensity projection (MIP) (b) and 3D (c) images. Upper segment of the C₁, C₂ and C₃.

Although there was no contraindication for general anesthesia, general anesthesia equipment and medications were kept ready for ineffective spinal anesthesia. Preoperative heart rate was 52 beats/min, arterial blood pressure was 150/55 mmHg and SpO₂: 98%. The patient was sedated with IV 1 mg midazolam. 2-3 lt/min oxygen administered via oxygen mask. The patient positioned left lateral for unilateral spinal anaesthesia. Under aseptic cautions, unilateral subarachnoid blockage administered with 5 mg hyperbaric bupivacaine at L4-5 interspace using a 27-G spinal needle. The patient was comfortable and hemodynamically stable throughout the 60 minutes of surgery, which was uneventful. During the operation hemodynamic parameters like heart rate, arterial blood pressure was in normal range and there was no necessity for inotropics. Cognitive status was normal during the intraoperative and postoperative period.

Discussion

Takayasu's arteritis (TAK) is a chronic inflammatory arteritis that affects large vessels like aorta and its main branches. Also TAK is known as occlusive tromboartropathy, Martorell Syndrome and pulseless disease [7]. The vessel seems shortened, rigid with perivascular sclerosis and adhesions to other tissues.

Takayasu arteritis is a rare disease but more common in Asian population. Takayasu arteritis has been rarely reported in childhood. Jain et al [9] from India reported 24 children with TAK, hypertension was the most frequent clinical presentation, seen in 83% of patients. A Turkish multicenter serie, TAK represented 1.5% of pediatric vasculitides [10].

Non-specific symptoms in TAK may cause a delay in definitive diagnosis. Clinical symptoms in TAK range from asymptomatic severe neurological complaints. Usually children with TAK had non-specific symptoms like headache, fever, myalgia, weight loss, hypertension at diagnosis period [1]. Symptoms due to ischemia which are prevalent in adults are having been rarely reported in children. In our patient there was dizziness due to narrowing of left common carotid artery and limb pain due to avascular necrosis of femoral head. Renovascular hypertension is the most frequent clinical symptom in TAK.

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Anaesthetic management of a patient with TAK has particularity, especially in pediatric age group the anaesthetic technique come into prominence. Accurate blood pressure monitoring is the most important point for the patients with TAK, therefore we decided to use right a. dorsalis pedis for invasive arterial monitorization because in our patient lower extremities were unaffected.

Spinal anesthesia has advantages of reduced drug dosage, profound sensorial block and reduced need for postoperative analgesic administration. There are such complications of general anaesthesia in peroperative period like pressure response during intubation and extubation, aspiration, tachycardia, hypertension, increase of intracranial pressure. Otherwise regional anesthesia may lead to hypotension and cerebral ischaemia. During regional anaesthesia the patient is awake which reliable monitor of cerebral functions is during the surgery (11,12).

During the surgical procedure the patient was awake but sedatized minimally with 1 mg Midazolam, thus the clinical outcomes of cerebral hypoperfusion could have been detected on the instant. This is the most simple and reliable monitoring of adequate cerebral perfusion (5). In this situation for maintaining stable hemodynamic parameters we selected low dose spinal anaesthesia for our patient.

Conclusion

The anaesthesia technique should be choosen based on the current clinical findings. Although general anaesthesia has been used for various surgical procedures with good results, spinal anaesthesia may be a useful alternative in pediatric patients. Especially for maintaining stable hemodynamic parameters,

low doses of local anaesthetics can be used for spinal anaesthesia. In conclusion, we think that spinal anaesthesia may be an effective and safe technique and it may present a valid alternative to other anaesthetic approaches for children.

References

1. Brunner J, Feldman BM, Tyrrell PN, Kuemmerle-Deschner JB, Zimmerhackl LB, Gassner I, Benseler SM. Takayasu arteritis in children and adolescents. *Rheumatology (Oxford)*. 2010;49(10):1806-14.
2. Johnston SL, Lock RJ, Gompels MM. Takayasu arteritis: a review. *J Clin Pathol*. 2002;55(7):481-6.
3. Sharma BK, Sagar S, Singh AP, Suri S. Takayasu arteritis in India. *Heart Vessels Suppl*. 1992;7:37-43.
4. Campos LM, Castellanos AL, Afiune JY, Kiss MH, Silva CA. Takayasu's arteritis with aortic aneurysm associated with Sweet's syndrome in childhood. *Ann Rheum Dis*. 2005;64(1):168-9.
5. Dutta B, Pandey R, Darlong V, Garg R. Low-dose spinal anaesthesia for a parturient with Takayasu's arteritis undergoing emergency caesarean section. *Singapore Med J*. 2010;51(6):e111-3.
6. Al Abrawi S, Fouillet-Desjonqueres M, David L, Barral X, Cochat P, Cimaz R. Takayasu arteritis in children. *Pediatr Rheumatol Online J*. 2008;6:17.
7. Johnston SL, Lock RJ, Gompels MM. Takayasu arteritis: a review. *J Clin Pathol*. 2002;55(7):481-6.
8. Kathirvel S, Chavan S, Arya VK, Rehman I, Babu V, Malhotra N, Bhukal I, Chari P. Anesthetic management of patients with Takayasu's arteritis: a case series and review. *Anesth Analg*. 2001;93(1):60-5.
9. Jain S, Sharma N, Singh S, Bali HK, Kumar L, Sharma BK. Takayasu arteritis in children and young indians. *Int J Cardiol*. 2000;75 Suppl 1:S153-7.
10. Ozen S, Bakkaloglu A, Dusunsel R, Soylemezoglu O, Ozaltin F, Poyrazoglu H, Kasapcopur O, Ozkaya O, Yalcinkaya F, Balat A, Kural N, Donmez O, Alpay H, Anarat A, Mir S, Gur-Guven A, Sonmez F, Gok F; Turkish Pediatric Vasculitis Study Group. Childhood vasculitides in Turkey: a nationwide survey. *Clin Rheumatol*. 2007;26(2):196-200.
11. Rowney DA, Doyle E. Epidural and subarachnoid blockade in children. *Anaesthesia*. 1998;53(10):980-1001.
12. Ubale P, Hemantkumar I. Spinal Anaesthesia for Caesarean Section in a Patient with Takayasu's Arteritis. *Bombay Hospital Journal*. 2012;54(1):165-7.