

Case Report

Atrial septal defect closure with axillary mini thoracotomy and total peripheral cannulation: a novel approach

Bhattarai A, Pradhan B

Departemnt of Cardiac Surgery, Green City Hospital, Dhapasi, Kathmandu

Corresponding author: Dr. Anil Bhattarai

Email: anbh10000@yahoo.com

Abstract

Ostium secundum atrial septal defect (ASD II) is one of the most common congenital heart defects (CHDs), occurring in 5% to 10% of children (1) and in 30% of adult patients with CHD (2,3). Surgical closure has been considered for many years the gold standard treatment for patients with an ASD II. Operative mortality is low (0% to 3%) (4–6) and long-term survival is high (25-year survival of 92%) (7). Here, we describe our initial experience with minimally invasive approach using total peripheral cannulation (TPC) and an axillary minithoracotomy (AMT) 4-5 cm long incision for surgical closure of an ASD. In our knowledge ASD closure with axillary mini-thoiracotomy is for the first time in the country.

Case Report

A 16 years old female patient presented to us with chief complain of palpitation. On echocardiographic examination she had diagnosed as an ASD II, left to right shunt with dilated right ventricle and right atrium, normal left ventricular function. After discussion with the patient and her family decided to operate her with new approach of axillary minithoracotomy and TPC. Intraoperative finding was 10mm in size osteum secundum ASD which was closed directly with 4.0 prolene. Postoperative period was uneventful and patient was discharged from the hospital on third post operative day.

Methods

Axillary minithoracotomy

Our current approach is through a limited right axillary skin incision (4 -5cm; Fig 1) just in mid axillary line. The subcutaneous attachments of the latissimus dorsi muscle were mobilized, and the muscle was retracted posteriorly by exposing the serratus anterior muscle that was split and entering the right chest in the fourth intercostal space. The use of TPC by percutaneous cannulation of the right internal jugular vein and a direct surgical isolation of the femoral vessels has allowed us to further minimize the surgical incisions. Before opening

the right atrium, both venae cavae were encircled and controlled with umbilical tapes. Standard aortic cross clamping followed by cold hematic cardioplegic cardiac arrest was obtained in all. Postoperative pain was controlled by a continuous intercostals infusion (Solution Bupivacaine 0.1% and Fentanyl 2 mcg/ml @ 5 ml/hr), intravenous paracetamol 8 hourly and intravenous fentanyl 50 mcg 2 hourly and subsequently with oral nonsteroidal anti-inflammatory medications (ketorolac 0.2 mg/kg intravenously every 8 hours). Leg pulses were checked in the postoperative period and at discharge two-dimensional echo control with Doppler evaluation of the leg vessels was performed.

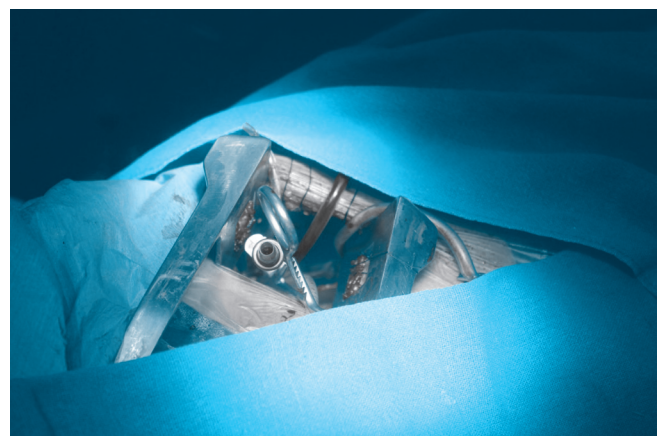


Figure 1. Right axillary minithoracotomy incision: intraoperative image.



Figure 2. Right axillary minithoracotomy: 1 year follow-up image.

Discussion

A routine median sternotomy has been the conventional approach for correction of congenital cardiac defects for many years. However, it often yields to poor cosmetic results with displeasure and psychological distress, especially in young female patients. Currently in many institutions, a full midline sternotomy is seldom used for correcting ASDs and single valve replacement and comparable clinical results can be achieved by means of various minimally invasive approaches [2–4]. The use of TPC [6] has shown to be a safe and excellent option in selected patients. It allows limited surgical chest incisions, reducing in this way the patient's surgical trauma.

Conclusion

In conclusion, the combination of AMT and TPC is safe and effective, with excellent clinical results that are comparable to classic (8-9) and other minimally invasive approaches.

Conflict of interest: None declared.

References

1. Hoffman JI, Christianson R. Congenital heart disease in a cohort of 19,502 births with long-term follow-up. *Am J Cardiol* 1978; 42:641–7.
2. Stellin G, Vida VL, Padalino MA, Rizzoli G. Surgical outcome for congenital heart malformations in the adult age: a multicentric European study. *Semin Thorac Cardiovasc Surg Pediatr Card Surg Ann* 2004; 7:95–101.
3. Brickner ME, Hillis LD, Lange RA. Congenital heart disease in adults. First of two parts. *N Engl J Med* 2000; 342:256–63.
4. Baskett RJ, Tancock E, Ross DB. The gold standard for atrial septal defect closure: current surgical results, with an emphasis on morbidity. *Pediatr Cardiol* 2003; 24:444–7.
5. Murphy JG, Gersh BJ, McGoon MD, et al. Long-term outcome after surgical repair of isolated atrial septal defect. Follow-up at 27 to 32 years. *N Engl J Med* 1990; 323:1645–50.
6. Ghosh S, Chatterjee S, Black E, Firmin RK. Surgical closure of atrial septal defects in adults: effect of age at operation on outcome. *Heart* 2002; 88:485–7.
7. Moodie DS, Sterba R. Long-term outcomes excellent for atrial septal defect repair in adults. *Cleve Clin J Med* 2000; 67:591–7.
8. Vida VL, Padalino MA, Boccuzzo G, Veshti AA, Speggiorin S, Falasco G, Stellin G. Minimally invasive operation for congenital heart disease: a sex-differentiated approach. *J Thorac Cardiovasc Surg* 2009; 138:933–6.
9. Vladimiro L. Vida, MD, PhD, Massimo A. Padalino, MD, PhD, Anil Bhattarai, MD, and Giovanni Stellin, MD. Right Posterior-Lateral Minithoracotomy Access for Treating Congenital Heart Disease. *Ann Thorac Surg* 2011; 92:2278–80.