Case Report

Indian Journal of Child Health

A quarterly, peer-reviewed, international, open access journal
published by Atharva Scientific Publications, India.

Tuberculous Aortic Root Abscess in a child: A case report

Jagdish Prasad Meena, Josmy Jose, Monica Juneja, Devendra Mishra, Rashmi Dixit, Aniruddha Vyas

Department of Pediatrics, Maulana Azad Medical College & Lok Nayak Hospital, New Delhi, India

How to cite this article: Meena JP, Jose J, Juneja M, Mishra D, Dixit R, Vyas A. Tuberculous Aortic Root Abscess in a child: A case report. Indian J Child Health. 2014;1(1):15-18.

Case Report

Tuberculous Aortic Root Abscess in a child: A case report

Jagdish Prasad Meena, Josmy Jose, Monica Juneja, Devendra Mishra, Rashmi Dixit, Aniruddha Vyas

From Department of Pediatrics, Maulana Azad Medical College & Lok Nayak Hospital, New Delhi, India.

Correspondence to: Dr J P Meena**,** Department of Pediatrics, Maulana Azad Medical College & Lok Nayak Hospital, New Delhi, India, 110002, **Email:** drjpmeena@yahoo.com

Received – 16 April 2014 Initial Review – 05 May 2014 Published Online – 22 May 2014

ABSTRACT

Although tuberculous aortitis is fairly common in adults, tuberculous mycotic aneurysm of aorta is rare with involvement of aortic root being very uncommon. The diagnosis depends on a combination of clinical criteria, including persistent fever and bacteraemia and echocardiographic confirmation. Because of the rarity of aortic root abscess in children, there is no consensus on a treatment strategy. We describe a 10-year-old male who presented with fever, abdominal pain and headache, and was found to have disseminated tuberculosis and aortic root abscess with mycotic aneurysm. Due to the presence of evidence of tuberculosis elsewhere in the body (multiple tuberculomas in brain, granulomas in liver, lichen scrofulosorum over abdomen), therapy with anti-tuberculous drugs was started to which the patient responded partially, but later died suddenly at home.

Key words: *Aortic root abscess, Aneurysm, Endocarditis, Tuberculosis*

Aortic root abscess is a life threatening complication of both native and prosthetic valve infection, which requires co-ordinated, skilled and experienced management. Tuberculous aortic aneurysm is a rare manifestation of tuberculosis. Although, tuberculous aortitis is fairly common in adults, tuberculous mycotic aneurysm of aorta is rare with involvement of aortic root being very uncommon. The most common valve affected is the aortic valve [1,2] The most common organism isolated in both adults and children appears to be *Staphylococcus* [1], although some studies report *Streptococcus* as the predominant isolated organism in adults [3]. Experience with mycotic aneurysm in children is very limited [4]. Uncontrolled infection causes a mycotic aneurysm of the sinuses of Valsalva, which is in free communication with the aortic root above the valve cusps. A true enclosed abscess cavity develops very rarely [5-6]. We report a pediatric case of tuberculous mycotic aneurysm of the aortic root.

CASE REPORT

A 10-year-old boy presented with complaints of intermittent fever, abdominal pain, loss of weight & appetite for 3 months and palpitation for 10 days. He denied using intravenous drugs. There was no past or family history of heart disease, no history of chest pain or shortness of breath or history of contact of tuberculosis.

On examination, his weight was between -2 to -3 SD and height was at – 2 SD. His pulse rate was 122/minute, regular and bounding; respiration was 28 breaths per minute; blood pressure was normal. Respiratory and nervous system examination were normal. Cardiac examination revealed visible pulsations in left 3rd, 4th and 5th intercostal space with normal first and second heart sound and no murmur. Slight hepatomegaly (4cm) and splenomegaly (2cm) were present. He had multiple, grouped, skin-colored papular lesions on the abdomen. There was no clubbing, osler's nodes, roth spots and other signs of infective endocarditis. Investigations revealed hemoglobin, 9.6 g/dl; leucocyte count, 8600/mm^3 (77% neutrophils); and ESR, 45 mm/h. Chest X-ray and USG abdomen was normal. Widal test, peripheral smear, urinalysis, and liver function tests (repeated twice) were normal. Echocardiography revealed a large aortic root abscess (2 cm x 2 cm) (**Fig. 1**). Child

was started on ceftriaxone, vancomycin and amikacin for infective endocarditis.

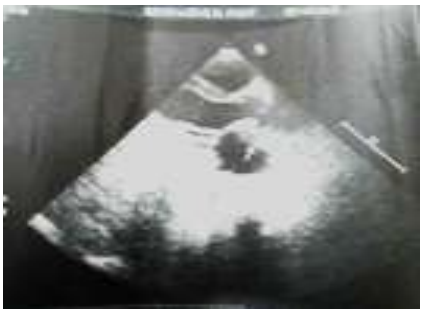

Fig 1: PLAX view - paraaortic valvular soft tissue thickening (arrow) extending into aortic root suggestive of abscess

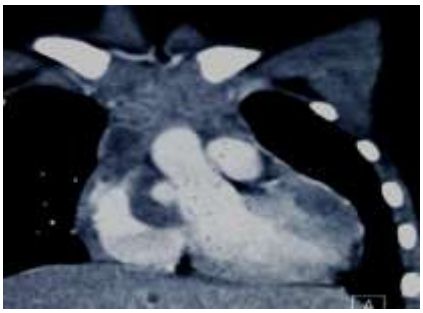

Fig 2: CECT Chest showing Aortic aneurysm

All blood and urine cultures were reported sterile later. After consultation with cardiothoracic surgeons, it was planned to continue antibiotics for 6 to 8 weeks and look for clinical and echocardiographic resolution. On day 4 of admission, child had generalized tonic-clonic seizures, for which intravenous loading dose of valproate was given. Serum electrolytes, blood glucose, serum calcium levels and CSF analysis were normal.

Contrast-enhanced CT head revealed multiple nodular and ring-enhancing lesions in bilateral cerebral hemisphere and brainstem with perilesional edema, likely to be tuberculosis.Mantoux test was 17 mm X15 mm at 48 hours. Gastric aspirates for acid fast bacillus were positive. Skin biopsy of the papular lesions on the abdomen showed lichen scrofulosorum. ELISA for HIV was negative. Contrast-enhanced abdominal CT revealed multiple granulomas in the liver and multiple subcentimetric mesenteric lymph nodes. CECT chest revealed mediastinal lymphadenopathy with necrotic nodes and miliary nodules in bilateral lungs and large aortic root abscess/ ?aneurysm (2 cm x2 cm) (**Fig 2**).

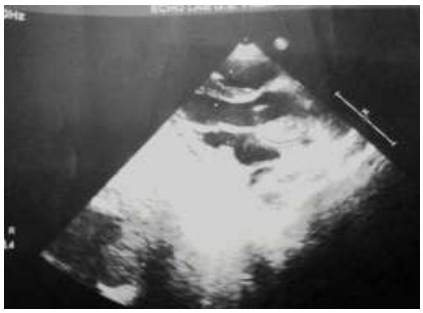

Fig 3: PLAX view (3 weeks later) shows paraaortic valvular soft tissue thickening extending into aortic root suggestive of abscess

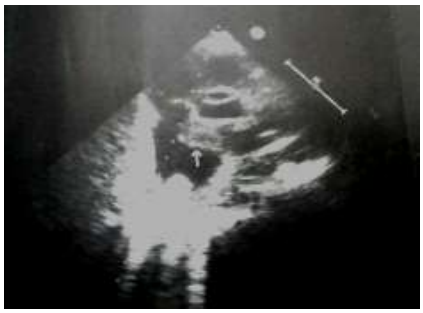

Fig 4: PSAX view (8 weeks later) shows paraaortic valvular soft tissue thickening (arrow) extends posterior to AV

Category 1 antituberculous treatment (ATT) was started in view of disseminated tuberculosis. Child became afebrile and general condition and appetite improved in next 3 weeks. Echocardiography after 2 weeks of ATT showed persistence of aortic root abscess of size 2×2 cm^2 (**Fig 3**). Possibility of tubercular etiology of aortic root abscess was kept as there was evidence of tuberculosis elsewhere and the abscess persisted on antibiotic therapy, though child was improving. Total of 8 weeks of intravenous antibiotics were completed and echocardiography repeated showed persistence of 2×2 cm^2 abscess (**Fig 4**)**.** Repeat cultures were also sterile. Antibiotics were continued because there was no reduction in abscess size and surgeons wanted to complete total 8 weeks antibiotics therapy prior to surgery. Child was discharged on ATT and planned to consider for surgery if the abscess persisted after completion of ATT.

During follow-up after around 5-½ months of ATT, child complained of epigastric pain and

cardiac examination revealed diastolic murmur at aortic region and Doppler echocardiography (**Fig 5A-C**) showed aortic regurgitation with reduction in abscess size but increased size of the cavity (3 cm x2.5 cm). Before the child could be taken up for surgery, he died at home, with severe chest and abdominal pain of short duration (? rupture of aneurysm).

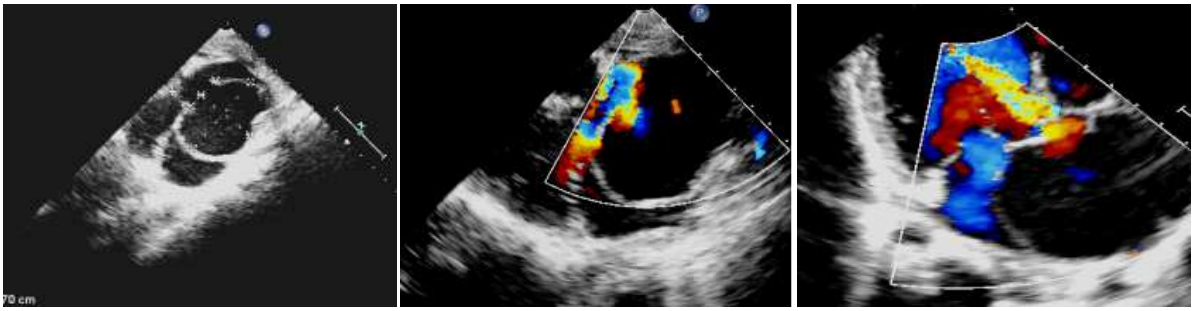

Figure: 5A **Figure: 5B** **Figure: 5C**

Figure 5: Echocardiographic picture after 5-½ months of antitubercular therapy: A) Tilted suprasternal view - large saccular aneurysmal cavity (5.1/3.7 cm) communicating with ascending aorta of 1.2 cm diameter with 2.1 cm diameter opening B) Color flow confirms mild aortic regurgitation and free flow from ascending aorta into cavity C) Tilted parasternal view - color flow shows moderate aortic regurgitation, flow communication between aorta and cavity, and cavity compressing adjoining left atrium

DISCUSSION

Infective endocarditis affecting the aortic valve may be complicated by an abscess cavity in the aortic root, this is more frequent in prosthetic than native valve infection. Aortic root abscess is extremely rare in children. The reported incidence of endocardial abscesses in adults is 60% with prosthetic valve and 30-40% with native aortic valve infective endocarditis [7-9]. The true incidence in children is not known. Five cases were found over a ten-year period at a supra-regional centre [4]. Aortic root abscess without involving aortic valve is extremely rare. Particularly, in adult patients, suspicion of an endocardial abscess is to be considered with the presence of persistent fever, a new pathologic murmur, pericarditis, recurrent embolic phenomena, and/or persistent bacteremia, despite appropriate antibiotic therapy [8].

Development of mycotic aneurysm requires a source of infection and damage to the vascular wall. The infection may spread from an adjacent area, either intravascular or extravascular. "Primary mycotic aneurysm", refers to infectious aneurysms unassociated with a demonstrable intravascular inflammatory process such as bacterial endocarditis. "Secondary mycotic aneurysms" are associated with a known source of infection**.** Embolization from bacterial endocarditis is the most frequently reported factor. Tuberculous involvement is secondary to extension by contiguity often lymphadenitis [6] but can also be pulmonary [10] vertebral [11] or digestive [12]. Haythorn [13] has previously described four types of tuberculous arterial disease 1) miliary TB of intima; 2) polypi of tuberculous tissue attached to intima 3) TB involving several layers of the wall; 4) Tuberculous aneurysm. Tuberculous bacterial aneurysm should be suspected whenever one or more of the following three clinical scenarios are present: 1) persistent chest, abdominal or back pain; 2) hypovolemic shock or evidence of major bleeding and 3) palpable or radiographically visible paraaortic mass especially if expanding or pulsatile.

Dissecting aortic aneurysms is most often caused by atherosclerosis, Marfan syndrome, presence of a bicuspid aortic valve, syphilis and rarely tuberculosis & trauma. Aneurysms of the root or ascending aorta may produce secondary aortic regurgitation, so a diastolic murmur may be detected on physical examination and, patients may present with congestive heart failure. The consequence of thoracic aneurysms is aortic dissection or rupture, which is potentially lethal. Typical symptoms of rupture of aneurysm include the abrupt onset of severe pain in the chest, neck, back, and/or abdomen. In this child, the supportive evidence and the clinical course supported a

tubercular etiology of the aortic root abscess. In children from endemic countries, tuberculosis may be considered as a possibility for this rare disorder, especially if there is non-response to antibiotic therapy.

Contrast-enhanced CT scanning and MR angiography are the preferred modalities to define aortic (and branch vessel) anatomy and both accurately detect and size thoracic aortic aneurysms. The surgical mortality of all prosthetic valve endocarditis is high 20–50%, and is highest in patients with aortic root abscess [14]. Debridement of all infected and devitalised tissue is the mainstay of the surgical treatment of aortic root abscess. Several different surgical techniques have been described, including closure of the defect with a patch [15] implantation of a composite prosthetic valve conduit, aggressive debridement of the abscess cavity and surrounding tissue with reconstruction of the left ventricular outflow tract with autologous pericardium, translocation of the aortic valve. When the aneurysm involves the aortic root and is associated with significant aortic regurgitation, one can perform composite aortic repair Bentall procedure. For those wishing to avoid the prosthetic valve required with the composite aortic graft, one option has been a pulmonary autograft, also known as the Ross procedure. Complications of surgical procedure include sudden death, heart block, rupture, perforation, and embolism.

CONCLUSION

Tuberculous aortic aneurysms are a well-known entity but rare in children. A combination of prolonged medical therapy and surgical intervention is warranted for disease-free, long-term survival.

REFERENCES

1. Come PC, RileyMF. Echocardiographic recognition of perivalvular infection complicating aortic bacterial endocarditis. Am Heart J 1984; 108:166–8.
2. John RM, Pugsley W, Treasure T, Sturridge MF, Swanton RH. Aortic root complications of infective endocarditis - influence on surgical outcome. Eur Heart J 1991; 12:241–8.
3. Byrd BF, Shelton ME, Wilson BH, Shillig S. Infective perivalvular abscess of the aortic ring: echocardiographic features and clinical course. Am J Cardiol 1990; 66:102–5.
4. Chaturvedi R, de Leval M, Sullivan ID. Urgent homograft aortic root abscess in infants and children. Heart. 1999; 81:62-6.
5. Brecker SJD, Jin XY, Yacoub MH. Anatomical definition of aortic root abscesses by transesophageal echocardiography: planning a surgical strategy using homograft valves. Clin Cardiol 1995; 18:353–9.
6. Peyton RW. Surgical correction of tuberculous pseudoaneurysm of upper abdominal aorta: first reported case. Ann Surg 1965; 162:1069–1074
7. Blumberg EA, Karalis DA, Chandrasekaran K, Wahl JM, Vilaro J, Covalesky VA, et al. Endocarditis-associated paravalvular abscesses – do clinical parameters predict the presence of abscess? Chest. 1995; 107:898-903.
8. Carpenter JL. Perivalvular extension of infection in patients with infectious endocarditis. Rev Infect Dis. 1991; 13:127-38.
9. David TE, Komeda M, Brofman PR. Surgical treatment of aortic root abscess. Circulation. 1989; 80:1269-74.
10. Hara M, Bransford RM. Aneurysm of subclavian artery associated with contiguous pulmonary tuberculosis. J Thoracic Cardiovasc Surg. 1963; 46:256-64.
11. Jain AK, Chauhan RS, Dhammi IK, Maheshwari AV, Ray R. Tubercular pseudoaneurysm of aorta: a rare association with vertebral tuberculosis. Spine J 2007; 7:249-53.
12. Oran I, Parildar M, Memis A. Mesenteric artery aneurysms in intestinal tuberculosis as a cause of lower gastrointestinal bleeding. Abdom Imaging 2001; 26:131-3.
13. Haythorn SR. Tuberculosis of the large arteries. JAMA. 1913; 60:1413-6.
14. Miller DC. Predictors of outcome in patients with prosthetic valve endocarditis and potential advantages of homograft aortic root replacement for prosthetic ascending aortic valve-graft infections. J Cardiac Surg 1990; 5: 53–62.
15. Symbas PN, Vlasis SE, Zacharopoulos L, et al. Acute endocarditis: surgical treatment of aortic regurgitation and aortico-left ventricular discontinuity. J Thorac Cardiovasc Surg 1982; 84:291–6.

Funding: None; Conflict of Interest: None Stated

How to cite this article: Meena JP, Jose J, Juneja M, Mishra D, Dixit R, Vyas A. Tuberculous Aortic Root Abscess in a child: A case report. Indian J Child Health. 2014;1(1):15-18.