

Case Report



Single Stage Operation with Two Different Incisions in a Patient with Ascending Aortic Aneurysm and Aortic Coarctation

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ABSTRACT

A case of successful a single stage repair of aortic coarctation and ascending aortic aneurysm in a 26-year-old man is presented. He was referred to our clinic due to chest pain. Because echocardiography had showed aneurysmatic ascending aorta and there was no distal peripheral arterial pulses, computed tomography was made. The computed tomography demonstrated giant ascending aorta and distal aortic coarctation. We performed Bentall procedure for ascending aorta and coarctation repair at single operation with two different incisions. At the one year follow-up, he was free of complications and two-dimensional echocardiography revealed normal heart contractility, good function of the aortic valvular prosthesis, a regular ascending aorta, and no evidence of aneurysm.

Key words: Ascending aort, aneurysm, aortic coarctation, single-stage repair, Bentall procedure

ÖZET

Aort Koarktasyonu ve Assandan Aort Anevrizması Bulunan Bir Hastada İki Farklı İnsizyonla Tek Evreli Cerrahi

Bu yazıda assandan aort anevrizması ve aort koarktasyonu olan 26 yaşındaki bir hastada aynı seansta başarılı cerrahi müdahale yapılan bir olgu sunulmuştur. Göğüs ağrısı kliniği ile başvuran hastada yapılan muayenede distal nabızların olmayışı ve ekokardiyografide assandan aort anevrizması belirlenmesi üzerine bilgisayarlı tomografi yapıldı. Tomografide dev bir assandan aort ve aortik koarktasyon belirlendi. Hastaya aynı seansta ve iki farklı insizyonla bentall operasyonu ve aort koarktasyonu tamiri yapıldı. Hastanın bir yıllık takibinde herhangi bir komplikasyon saptanmadı ve patolojik durum belirlenmedi. Kontrol ekokardiyografilerinde normal kardiyak kontraktilite, iyi fonksiyone aortik kapak ve normal konfigürasyonda assandan aorta tespit edildi.

Anahtar Sözcükler: Assandan aort, anevrizma, aortik koarktasyon, tek evreli tamir, bental prosedürü

Aortic coarctation is a serious pathology required surgical treatment. About 50% of uncorrected isolated aortic coarctation cases are lost up to the age of 10, only 10% may reach the age of 50 (1). The most common reason for death from untreated aortic coarctation is the aneurysm or rupture of aorta or side branches with a rate of 23% (1).

Aortic insufficiency resulting from annuloaortic ectasia and ascending aortic aneurysm together with aortic coarctation rarely occur, and surgical treatment is difficult. It is very important to decide whether surgical operation will be of one and two stage, and to determine intra-operative strategy. Aortic coarctation is a congenital vessel disease that can cause such complications as myocardial infarction, congestive cardiac failure, infective endocarditis, aortic aneurysm, aortic dissection or rupture and intracranial bleeding as a result of present resistant hypertension in adult age (2).

The aneurysm of the ascending aorta is a life-threatening complication of aortic coarctation. Studies report various operations done when aortic aneurysm (1-3) occur together with aortic coarctation. This combined condition is usually treated by one or two-stage surgery when aortic aneurysm exists. If there is

ascending aortic aneurysm in addition to aortic coarctation without aortic dissection, the first repair must be performed for aortic coarctation. In our patient, ascending aorta aneurysm and aortic coarctation were operated on the same stage with two different incisions.

CASE REPORT

A 26-year-old man was referred to our unit for sudden onset of retrosternal, constrictive pain. A 3/6 systolic murmur was heard in the aortic area. Blood pressure was 160/100 mmHg in upper extremity and 80/40 mmHg in the lower extremity. Chest radiography showed rib notching and very large mediastinal site (Figure 1A). A computerised tomogram (CT) of the chest revealed a giant aneurysm of the ascending aorta, normal aortic arch, and a coarctation of the aortic isthmus (Figure 1B). Transthoracic echocardiogram (TTE) confirmed the presence of an aneurysm of the ascending aorta and advanced aortic valve incompetence. The diameter of the ascending aorta was 11 cm. The patient underwent emergency surgery. In order to improve of the coarctation, a left thoracotomy was carried out at the fourth intercostal (Figure 1C).

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The patchplasty was made with a PTFE patch for coarctation repair with side clamping without atrio-femoral shunt. Then, the patient was rotated to the flat position, and a median sternotomy was performed. The pericardium was opened. The aneurysm was very large, but the aneurysm was limited to the ascending aorta, and the proximal segment of the aortic arch was not affected (Figure 1D). There was a cross-clamping site. Cardiopulmonary bypass was initiated with axillary arterial and right atrium venous cannulation. The ascending aorta was cross-clamped and incised transversely. There was no dissection in the ascending aorta. The sinuses of Valsalva were

abnormal, they were suspended, and the coronary ostia were displaced. The aortic valve was bicuspid, with partially fused, thickened, and calcified leaflets. The aortic valve was excised, and the segment of the ascending aorta comprising the aneurysmal part was resected. The patient was performed modified Bentall procedure with a 30 mm ascending aortic graft as described by Yakut et al (4). The anastomoses were reinforced with gelatin resorcinol glue and teflon strips. The thoracotomy and then sternotomy were closed after bleeding control. Intensive care unit stay was 4 days. No cerebral, respiratory or renal complications occurred.

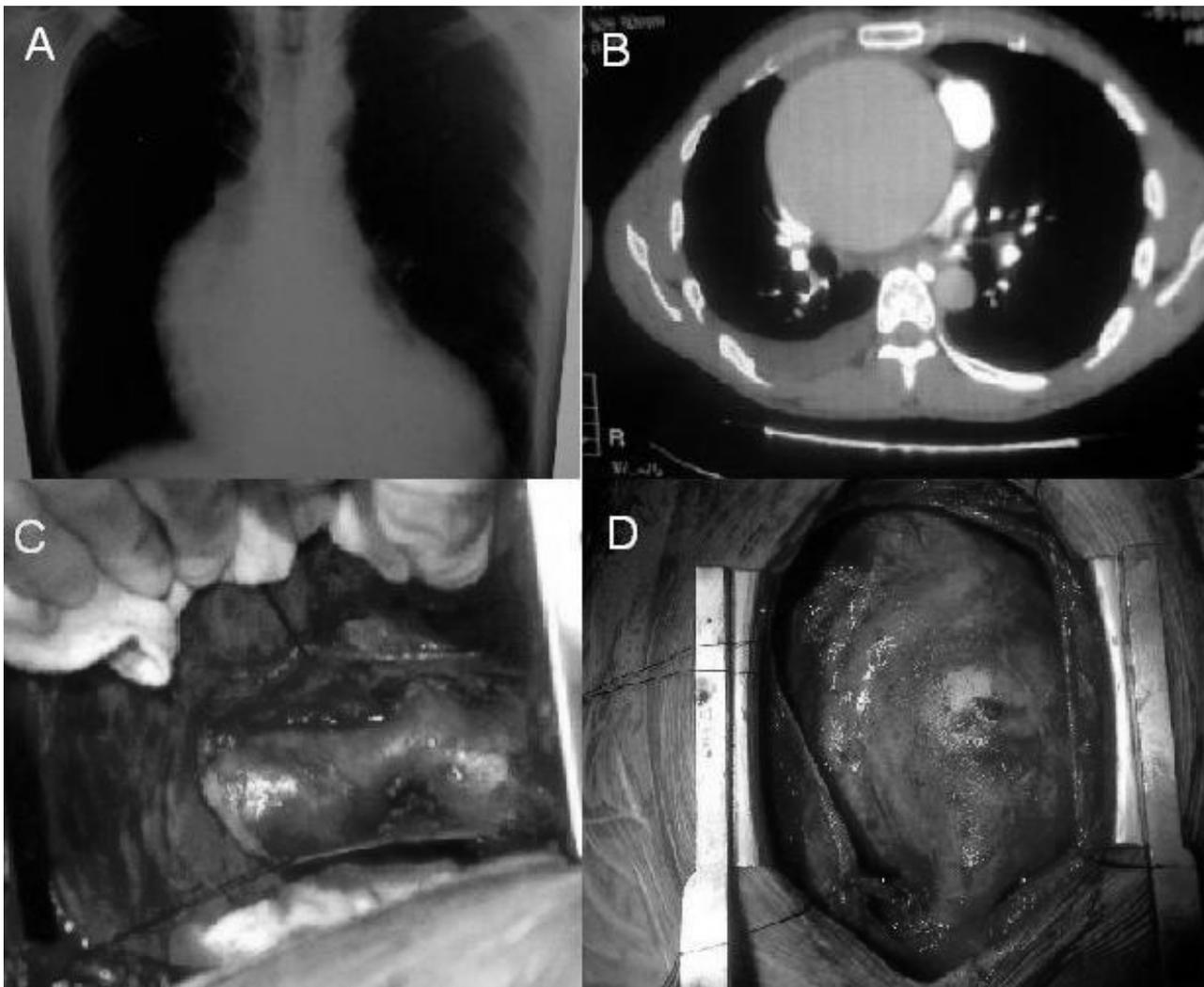


Figure 1A: Chest radiography showed rib notching and very large mediastinal site.

Figure 1B: Computerised tomogram of the chest revealed a giant aneurysm of the ascending aorta, normal aortic arch, and a coarctation of the aortic isthmus.

Figure 1C: A left thoracotomy showing descending aortic coarctation under right subclavian artery.

Figure 1D: After median sternotomy, giant ascending aortic aneurysm was shown in the operative term.

DISCUSSION

Vascular complications and arterial hypertension are major risk factors in the evolution of disease connected with coarctation of the aorta. The miscellaneous studies pointed out that aortic rupture was the cause of death in 19% to 23% of patients with coarctation of the aorta; in 75% of the instances, rupture take place in the ascending aorta (2).

In young patients with ascending aortic aneurysm together with aortic coarctation, initially aortic coarctation must be repaired in one or two-stage procedure, in order to lessen proximal hypertension, decrease the chances of progressive dissection or rupture, and enable safe perfusion during correction of the aortic aneurysm (5). Surgical repair may be performed through two different incisions by thoracotomy and sternotomy in cases treated with surgery in one stage (3) or coarctation treatment may be carried out with extra-anatomical bypass following ascending aortic aneurysm repair by sternotomy only in one stage (1). Extra-anatomical procedures frequently can be used for the interrupted aortic arch, recoarctation and in combined procedures such as with valve and coronary artery surgery (6). For this reason, we did not prefer extra-anatomical bypass procedure that we thought to be a time-consuming and palliative procedure.

The aim of repair of cases with aortic coarctation is to allow proximal blood flow to pass distally without obstruction. This can be achieved by either widening the narrowed region or by creating an alternate path for blood flow. Surgical or endovascular techniques can be used as an alternative treatment. End-to-end anastomosis, prosthetic interposition tube grafts, subclavian flap repair, and extra-anatomical corrections (7) can be preferred for surgical treatment. We preferred to perform patchplasty to this patient of old age.

The topic of how to replace the aortic valve in the presence of coarctation was not difficult to solve, because the valve was

grossly abnormal: it was therefore excised and replaced with a mechanical prosthesis. Such surgical procedures as, classical and modified Bentall applications, separated surgical treatment, David and Ross procedures can be applied in cases of ascending aortic aneurysm and root replacement could be applied. We performed a Bentall replacement of the ascending aorta and aortic valve with a composite prosthesis as described by Yakut et al (4), because the aortic root was large, the sinuses of Valsalva were enlarged, and the coronary ostia were displaced in our patient. The flanged composite graft offers excellent long-term results, with very low prevalence of prosthetic-related complications. Because the new created sinuses and the flange are especially helpful to continue physiologic function of the aortic root (7), we preferred Bentall procedure with flanged technique.

CONCLUSION

In young patients with ascending aortic aneurysm together with aortic coarctation, initially aortic coarctation must be repaired in one or two-stage procedure, in order to lessen proximal hypertension, decrease the chances of progressive dissection or rupture, and enable safe perfusion during correction of the aortic aneurysm. Besides, surgical repair may be performed through two different incisions by thoracotomy and sternotomy in cases treated with surgery in one stage or coarctation treatment may be carried out with extra-anatomical bypass following ascending aortic aneurysm repair by sternotomy only in one stage. Despite of increased anesthesia period and infections risk, one-stage technique two different incisions by thoracotomy and sternotomy allowed good exposure and radical corrective repair in both ascending aortic aneurysm and coarctation pathology. With this procedure, the extra-protective methods didn't necessities for spinal site during operation.

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