



## Case Report

# Extra Anatomical Bypass for Calcified Coarctation of Aorta in 58 Year old Individual - A Case Report

Authors

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## Abstract

*The surgical management of adult coarctation of aorta is quite challenging. Endovascular intervention has limited role in adult calcified coarctation of aorta. Various surgical options are available for management. We are reporting a 58 year old intractable hypertensive male with calcified coarctation of aorta who underwent an Extra Anatomical Bypass using 20mm Integard Woven Dacron graft from left subclavian artery to descending thoracic aorta. He had an uneventful postoperative period with a small gradient across the conduit.*

**Keywords:** Adult coarctation of aorta, Extra Anatomical bypass.

## Introduction

The surgical management of adult coarctation of aorta is quite challenging. Calcification within the coarctation alters surgical approach. Presence of coarctation of aorta in adult patients is very rare because without correction the mean life expectancy of patients with aortic coarctation is 35 years and 90% of those patients do not survive beyond the age of 50 years<sup>1</sup>. Ideally, coarctation of aorta should be corrected in early period of life to prevent occurrence of irreversible changes. Adolescents with coarctation of aorta require different surgical methods compared to children.

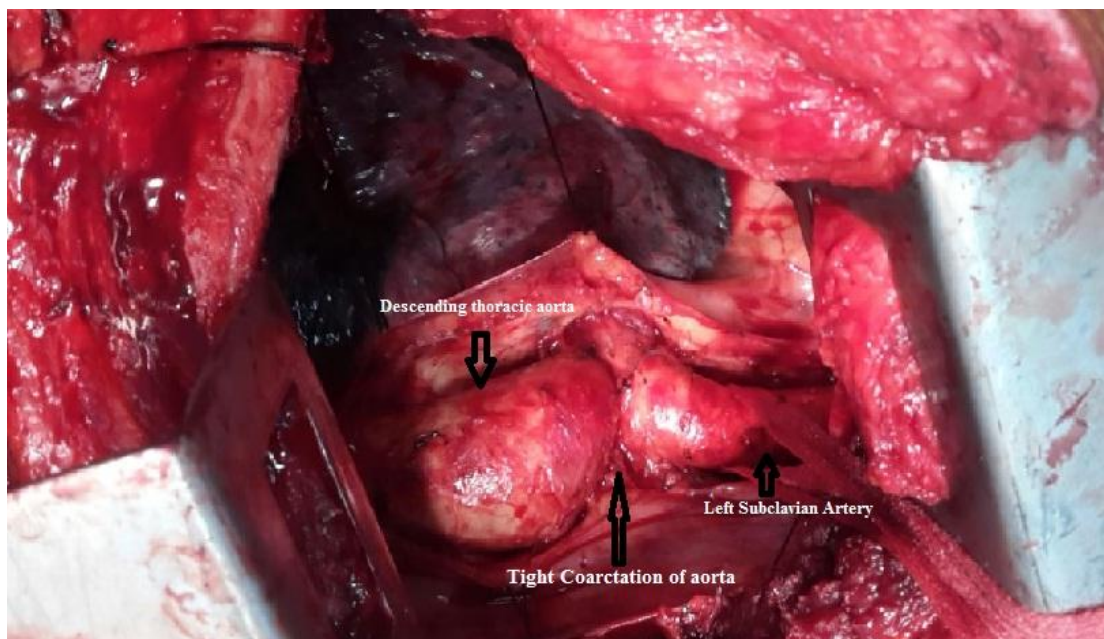
Anatomical repair is performed in young individuals which involves resection of involved segment and end to end anastomosis. However, anatomical repair in coarctation in adults increases risk due to difficulty in mobilization of aortic arch, thickened and calcified aortic wall and presence of multiple collaterals<sup>2</sup>. Extra anatomical bypass is preferred treatment of choice in adult coarctation.

## Case Report

A 58-year old male diagnosed as left subclavian post ductal coarctation was admitted for

management. He had intractable hypertension. He also had history of syncope 5 years back. CT pulmonary angiogram showed coarctation of the aorta with moderate stenosis (postductal) and significant collateral circulation. Echocardiography showed hypertrophied left ventricle with good left ventricle contraction at rest. Left posterolateral thoracotomy approach was taken. Left pleural cavity approached through fourth intercostal space. Tight coarctation approximately 2cm in length just distal to left subclavian artery was present [Figure 1]. Distal

arch of aorta, proximal descending thoracic aorta and proximal subclavian artery were heavily calcified. Descending thoracic aorta just distal to coarctation was thinned out. Hence coarctation of aorta was bypassed using 20mm Intergard Woven Dacron graft from distal subclavian artery to descending thoracic aorta using side-biting vascular clamp [Figure 2]. Aorta was not denuded of the pleura as the wall is thin and fragile. Patient had an uneventful recovery. Also, requirement of anti-hypertensive medication was drastically reduced.



**Figure 1:** Tight coarctation of aorta.



**Figure 2:** Extra anatomical bypass.

## Discussion

Coarctation of the aorta is typically a discrete narrowing of the thoracic aorta just distal to the left subclavian artery. However, the constriction may be proximal to the left subclavian artery or rarely in the abdominal aorta.

Aortic coarctation presenting during adult life, most frequently represents cases of recoarctation, following previous transcatheter or surgical therapy, or missed cases of native coarctation. Aortic coarctation may be recognized in the adult, usually because of systemic arterial hypertension and discrepant upper and lower extremity pulses. Patient may complain of exertional headaches, leg fatigue or claudication.

Adult coarctation of aorta is quite rare because of reduced life expectancy. Without correction the mean life expectancy of patients with aortic coarctation is 35 years and 90% of those patients die before reaching the age of 50 years<sup>1</sup>. The European Society of Cardiology 2010 guidelines for management of grown-up congenital heart disease say that all patients with a non-invasive pressure difference >20 mmHg between upper and lower limbs, regardless of symptoms but with upper limb hypertension (>140/90 mmHg in adults), pathological blood pressure response during exercise, or significant LVH, should have the intervention (class IC indication)<sup>3</sup>.

Surgical repair of coarctation can be achieved by several techniques: resection with end-to-end anastomosis, subclavian flap aortoplasty in infants with long-segment coarctation, a bypass graft across the area of coarctation when the distance to be bridged is too long for an end-to-end repair or prosthetic patch aortoplasty<sup>4</sup>. Problems with these techniques have included a significant incidence of aneurysm formation with Dacron patch aortoplasty, and an unacceptably high recoarctation rate with the subclavian flap aortoplasty. The technique of extended end-to-end anastomosis appears to give good short-term to intermediate-term results with a low complication rate and has gained in popularity as the technique of choice when possible to use<sup>5</sup>. A

complication associated with all the surgical techniques is aortic dissection, which can occur even late after surgical repair. Surgical mortality is rare (usually less than 1 percent). Morbidity includes early postoperative paradoxical hypertension, left recurrent laryngeal nerve paralysis, phrenic nerve injury, and subclavian steal. Paraplegia due to spinal cord ischemia and mesenteric arteritis with bowel infarction are rare complications<sup>6</sup>.

The case presented best illustrates that coarctation of the aorta is a congenital cardiac malformation that can go undiagnosed until old age, having only hypertension as a marker of its presence, because clinical signs can be subtle and overlooked if a complete physical exam is not performed.

## Conclusion

Adult coarctation of aorta is rare finding and should be kept in mind as a differential diagnosis of hypertension. It can be easily diagnosed by complete physical examination of the patient. CT angiography is the gold standard diagnostic modality. Conventional excision of coarctation and end to end anastomosis is not feasible in some adult patients. Hence, extra anatomic bypass offers a convenient and good alternative for management.

## Declarations

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