

# Case Report on Left Subclavian Artery Complete Stenosis Underwent Bypass Grafting under General Anaesthesia

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**Abstract:** *Subclavian artery stenosis is one of the significant forms of peripheral artery disease. In most of the patients it is asymptomatic and if diagnosed it is treated with medical therapy. Invasive therapy is reserved for symptomatic patients. It can lead to upper limb pain to ischemia of upper limb, brain and in some cases in heart. Most common cause is atherosclerosis and which increases the risk for cardiovascular events and also subclavian steal syndrome.<sup>1</sup> There are two modalities to give anaesthesia during subclavian artery stenosis surgery such as regional and general anaesthesia which have their own side effects.*

**Keywords:** PTFE (Polytetrafluoroethylene), SAS (Subclavian artery stenosis), SCA (Subclavian Artery), ICA (Internal Carotid Artery), CT (Computed Tomography).

## 1. Introduction

Subclavian artery stenosis is rare and approximately 2% of the population has subclavian artery stenosis. Subclavian artery stenosis causes notable morbidity because it is usually asymptomatic and later it causes symptomatic ischemic problems that affect upper limb, heart and brain. Atherosclerosis is the most common cause and others include congenital abnormalities such as aberrant subclavian artery or right sided aortic arch. Left subclavian artery stenosis is more commonly affected than right. If there is isolated stenosis, than symptoms may be less and limited but if there is bilateral stenosis, or associated with carotid or vertebral artery stenosis, the likelihood of symptoms increases. Symptoms varies from arm claudication or muscle fatigue, rest pain and finger necrosis to neurological issues like visual disturbances, syncope, ataxia, vertigo, dysphasia and facial sensory deficits, and to cardiac issues like coronary subclavian steal syndrome. Diagnosis typically involves physical examination that can display unequal arm blood pressures, absent or diminished pulses, gangrenous skin changes, neurological and cardiac sequelae.<sup>2</sup> Treatment includes stenting of subclavian artery, surgical bypass graft like common carotid subclavian artery bypass graft, percutaneous transluminal angioplasty.<sup>2,3</sup> General anaesthesia is more commonly provided for surgery, but surgery can be conducted under regional anaesthesia such as cervical epidural anaesthesia, combined superficial-deep cervical plexus block. Hereby we present a case of left subclavian artery complete stenosis, posted for left SCA bypass graft from left common carotid artery under general anaesthesia.

## 2. Case

We present a case of 61year old male of 55kg weight with left SCA complete stenosis. He presented with history of pain in left arm since 2years which increases on lifting heavy weight and associated with restricted movement at

shoulder joint. He was a chronic smoker since 30years. He was not having any other co-morbidities and has no history of surgery in past. Airway assessment revealed mallampatti grade 2, edentulous, flexion and extension movements at the level of neck were normal.

## 3. On examination

Vitals were; temperature- 37.8 degree Celsius, heart rate- 76 per minute, blood pressure- 148/86 mmHg, respiratory rate- 16 per minute. Pre-anaesthetic systemic checkup was unremarkable. Routine blood investigations were normal. ECHO shows EF of 65% with normal left ventricle systolic function. Doppler of bilateral upper limb showed 2 soft tissue plaque of approx. 7x1.8mm and 10.4x1.9mm is noted at right carotid bulb and calcified plaque of 5.3x1.2mm at right ICA just after bifurcation, a soft tissue plaque of 6.7x1.3mm at left carotid bulb just before bifurcation. CT Angiography bilateral upper limb shown non-opacification of proximal segment of left SCA from its origin upto a length of 3-3.5cm.suggestive of thrombosis and visualized aortic arch shows moderate atherosclerotic wall thickening (Figure-1). CT bilateral carotid arteries with branches and arch of aorta with branches showed eccentric soft plaque in proximal right ICA causing mild luminal narrowing, soft plaque with complete occlusion of 1<sup>st</sup> part of left SCA, soft plaque with mild luminal narrowing in right carotid bulb, hypoplastic left vertebral artery (Figure-2). NCCT Head showed age related changes. HRCT Chest showed paraseptal and centriacinar emphysema in both lungs. Patient was advised to NPO 6hrs prior to surgery and take tab. Pantoprazole 40mg in the morning with sips of water prior to surgery.

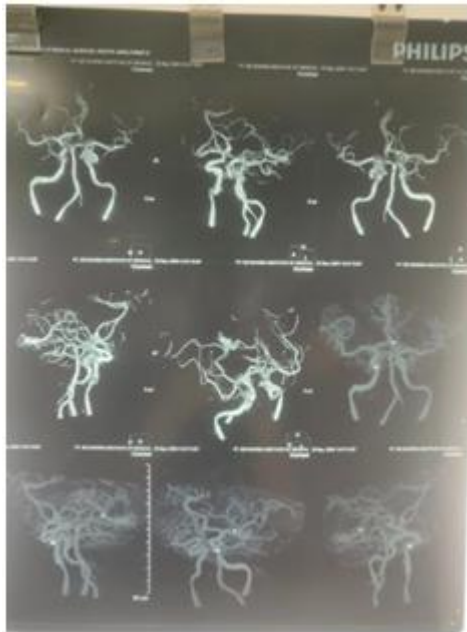


Figure 1



Figure 2

#### 4. Surgery plan

Left subclavian artery complete occlusion posted for left common carotid artery to left subclavian artery bypass grafting with PTFE graft was decided to be done under general anaesthesia. After checking consent and confirming fasting status, patient brought to the operation theatre and all routine monitors attached (ECG, NIBP, SPO2). IV line secured with 18G cannula and kabilyte started. Inj. Glycopyrrolate 0.2mg IV given. Preoxygenation done with 100% oxygen for 3minutes. After induction done with Inj. Fentanyl 100mcg IV and Inj. Thiopentone 300mg IV check ventilation done. Inj. Atracurium 25mg IV stat given. Patient was ventilated with oxygen and sevoflurane for 3minutes. Under direct laryngoscopy, oro-endotracheal intubation done with endotracheal tube of 8.5mm ID and connected to Bain's circuit. Intubation is confirmed via direct visualization of bilateral chest rise, auscultation with

stethoscope and capnograph. Anaesthetic machine circuit is then connected to endotracheal tube and general anaesthesia was provided as per protocol. Under all aseptic precautions, right femoral artery was cannulated and attached to IABP monitor. Under all aseptic precautions, left femoral vein was cannulated and all three ports flushed and checked and attached to fluid for central venous pressure monitoring. Surgery was allowed to commence. Rest of the procedure proceeded as routine. Surgery last for 3hours and patient was haemodynamically stable throughout the surgery. Patient was successfully extubated after completion of surgery and post-operative course were uneventful. (Figure-3)

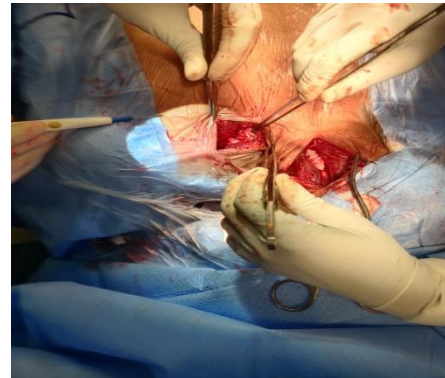


Figure 3

#### 5. Discussion

Vascular surgeries of upper limb are less commonly performed, as it presents with own set of challenges. Patients require careful pre-assessment and meticulous perioperative care for the successful outcome. Subclavian artery stenosis with or without subclavian steal syndrome is relatively rare and mostly asymptomatic. Only symptomatic patients present for treatment.<sup>4</sup> Regional anaesthesia is very good alternative to general anaesthesia but it still have some consequences like risk of neurologic injury, diaphragmatic dysfunction, injury to vertebral artery, local anaesthetic toxicity and also there is patient discomfort. Therefore, general anaesthesia in many cases except in high risk and patients with cardiac illness is still the anaesthesia of choice.<sup>5</sup>

#### 6. Conclusion

Early diagnosis and treatment of subclavian artery stenosis can prevent significant morbidity and even mortality. Medical therapy is used to avoid progression of disease and if symptoms cannot be controlled medically surgery is the last resort. Surgery has been traditionally the treatment of choice and it can decrease the chances of restenosis.<sup>1</sup>In our case, bypass grafting from common carotid artery was done under general anaesthesia and we preferred general over regional anaesthesia because it is safer and there was no contradiction to it and it was more comfortable for patient.

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