

Subclavian Artery Stenosis: How we treat it

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ABSTRACT

The incidence of stenosis of the subclavian artery represents 3 to 4% of the general population [1]; atherosclerosis is the most common cause. We conducted this study to review the stenocclusive pathology of the subclavian artery, and to expose our experience in surgical and endovascular management. It is a retrospective and analytical study conducted within the department of vascular surgery of Mohammed VI CHU. Surgical treatment consisted of subclavio-carotid transposition in 2 cases, carotid-bypass grafting in one case and angioplasty with stent placement in the latter case. It is important for the surgeon to have a thorough understanding of the anatomy and etiology of subclavian artery stenosis, while considering the surgical options. This case series presents some of the treatment options available to vascular surgeons for the management of symptomatic subclavian artery disease.

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Introduction

The incidence of stenosis of the subclavian artery represents 3 to 4% of the general population [1]; atherosclerosis is the most common cause.

Depending on the degree of stenosis, it can remain asymptomatic or lead to neurological disorders with vertigo and instability (vertebrobasilar insufficiency), an upper limb claudicating (pain, muscle cramp) with a tension asymmetry between the two arms.

Therapeutic management is essentially based on open-air revascularization (bypass and transposition) or endovascular procedures.

We conducted this study to review the stenocclusive pathology of the subclavian artery, and to expose our experience in surgical and endovascular management.

Material and Methods

It is a retrospective and analytical study conducted within the department of vascular surgery of Mohammed VI CHU concerning four observations of patients hospitalized between September 2014 and October 2016 for symptomatic subclavian artery stenosis.

Results

The average age of our patients was 78 years, 3 women and one man; atheroma was the cause of the stenosis in all cases. Two patients consulted for vertebral-subclavian syndrome and the other two for ischemia of the upper limb.

All the stenosis sat on the prevertebral segment of the artery.

Surgical treatment consisted of subclavio-carotid transposition in 2 cases, carotid-bypass grafting in one case and angioplasty with stent placement in the latter case.

The follow-up was simple for the 4 patients with an average duration of hospitalization of seven days.

The clinical and radiological controls were satisfactory for the four patients over an average follow-up period of 24 months.

Discussion

Hemodynamically significant stenosis of the subclavian artery usually present with signs of upper limb ischemia or signs of vertebrobasilar insufficiency [2].

Atherosclerosis is the most common etiology [3], subclavian artery involvement during the course of inflammatory diseases such as Takayasu's disease remains rare, especially in the elderly.

A small percentage of etiology is represented by congenital malformations (arteria lusoria ..) [4].

We describe through this study the three methods of restoring blood flow to the upper limb in four patients with ischemic symptoms on subclavian stenosis.

It is widely accepted that subclavian artery stenting should be a first-line treatment.

Angioplasty can, however, cause intraluminal hyperplasia and the levels of re-stenosis are greater than those of extrathoracic surgical revascularization [5].

The transposition of the subclavio-carotid artery is particularly justified if there is a proximal stenosis of the subclavian artery, the existence of embolism pathology of the upper limb, the need to revascularize at best a vertebral artery in the presence of vertebrobasilar ischemia.

It is a safe technique with low reocclusion rates [6], and an actuarial permeability ranging from 95 to 100% for mean follow-ups beyond 50 months [7], it is the technique of choice for treating subclavian flight due to an aberrant right subclavian artery [8].

The last method is represented by the carotido-sub clavian bypass. A wide range of grafts can be used, including Dacron, autologous vein and PTFE however this technique remains fraught with complications with mortality rates of 0 to 3% and a risk of stroke of 0-5% [9, 10].

Subclavio-carotid transposition is today the standard surgical correction technique for these lesions, to which the endovascular procedures should be compared especially with regard to the primary and secondary permeability.

Conclusion

It is important for the surgeon to have a thorough understanding of the anatomy and etiology of subclavian artery stenosis, while considering the surgical options.

This case series presents some of the treatment options available to vascular surgeons for the management of symptomatic subclavian artery disease.



Figure 1. A/ tight stenosis of ASC. B/ control angioscanner showing left subclavio-carotid transposition.



Figure 2. Intraoperative images showing left subclavio-carotid bypass in grand saphenous vein.

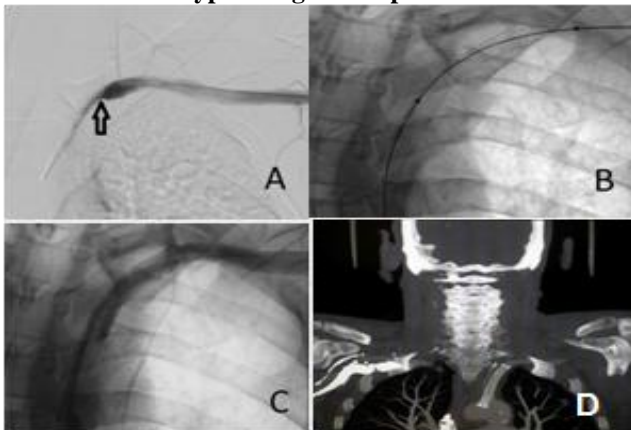


Figure 3. A, B, C endovascular procedure showing angioplasty and placement of a right subclavian artery stent. D: CT control.

References

- 1)Ochoa VM and Yeghiazarians Y : Subclavian artery stenosis: A review for the vascular medicine practitioner; vascular medicine 2011 Feb; 16 (1): 29-34
- 2)B.J. Potter, D.S. Pinto, Subclavian steal syndrome, *Circulation* 129 (22) (2014)2320–2323..
- 3)English JA, Carell ES, Guidera SA, Tripp HF. Angiographic prevalence and clinical predictors of left subclavian stenosis in patients undergoing diagnostic cardiac catheterization. *Catheter Cardiovasc Interv* 2001; 54: 8–11.
- 4)H. Budincevic, K. Starcevic, I. Bielen, V. Demarin, An aberrant subclavianartery exhibiting the partial steal phenomenon in a patient with VACTERLassociation, *Intern. Med.* 53 (16) (2014) 1859–1861)
- 5)A.F. AbuRahma, M.C. Bates, P.A. Stone, B. Dyer, L. Armistead, L. Scott Dean, P.Scott Lavigne, Angioplasty and stenting versus carotid-subclavian bypass forthe treatment of isolated subclavian artery disease, *J. Endovasc. Ther.* 14 (5)(2007) 698–704.
- 6)M. Duran, D. Grotmeyer, M.A. Danch, K. Grabitz, H. Schelzig, T.A. Sagban,Subclavian carotid transposition: immediate and long-term outcomes of 126surgical reconstructions, *Ann. Vasc. Surg.* 29 (3) (2015) 397–403
- 7)Schardey HM, Meyer G, Rau HG, Gradl G, Jauch KW, Lauteryung L. Subclavian carotid transposition. An analysis of a clinical series and a review of litterature. *Eur J Vasc Endovasc Surg* 1996 ; 12 : 431-6.
- 8)P. De Vleeschauwer, S. Horsch, Subclavian steal syndrome in a congenitalyanomalous subclavian artery: a case report, *Ann. Vasc. Surg.* 1 (3) (1986)389–391.
- 9)M.M. Law, M.D. Colburn, W.S. Moore, W.J. Quinones-Baldrich, H.I. Machleder,H.A. Gelabert, Carotid-subclavian bypass for brachiocephalic occlusivedisease, *Stroke* 26 (1995) 1565–1571.
- 10)Ziomeck S, et all. The superiority of synthetic arterial graft over autologous veins in carotid subclavian bypass. *J Vasc Surg* 1986 ; 3 : 140-5.