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The advent of endovascular therapy for occlusive lesions of the supra-aortic trunks has largely overshadowed traditional surgical approaches (endarterectomy, direct transthoracic repair) to this complex group of patients. Nevertheless, cervical reconstruction remains a safe and typically durable treatment. The majority of cervical reconstructions are carotid-subclavian bypasses or transposition procedures, given the high relative frequency of lesions affecting the left subclavian artery. Other reconstructions such as carotid-carotid and axillary-axillary bypasses are much less common.

In a large series of cervical reconstructions, Berguer and colleagues reported on 182 consecutive procedures in 173 patients performed over a 16-year period.<sup>1</sup> The majority were performed for atherosclerotic disease. During the same period of time, 100 transthoracic repairs were performed. Of the study group, more than one-fourth (27%) had multiple lesions of the supra-aortic trunks. The majority of the operations were subclavian-to-carotid bypasses; only 4 of 182 (2%) were carotid-carotid grafts. Two of the four were placed via a retropharyngeal tunnel, the other two via a pretracheal route.

Indications for carotid-carotid bypass are as follows:

- Occlusive lesions of the common carotid artery or brachiocephalic trunk (innominate artery) not amenable to direct reconstruction or endovascular therapy. In patients with ostial left common carotid lesions, carotid-carotid bypass is typically reserved for those in whom the left subclavian is not suitable as a donor vessel. This indication is further divided into symptomatic (transient ischemic attack, stroke, vertebral-basilar ischemia) → 75% diameter reduction or ulcerated lesion—and asymptomatic—preocclusive lesions.
- Revascularization of the left common carotid artery to provide a “landing zone” for endovascular repair of aneurysms involving the aortic arch/descending thoracic aorta.
- Preprocedural imaging involves contrast, computed tomographic, and magnetic resonance angiography.

Technical considerations include the following:

- Choice of conduit: polytetrafluoroethylene, Dacron, autologous vein, transposition
- Tunnel:
  - Retropharyngeal: short bypass, cosmetically more acceptable, does not preclude subsequent sternotomy, bypass placed in the space between the pharynx and the pre-vertebral lamina.
  - Subcutaneous/pretracheal

## Results

For results of contemporary series, see Table 1.<sup>1-5</sup>

**Table 1. Results of Contemporary Series**

Study	N	Stroke/death	Patency	Follow-Up
Abou-Zamzam et al, 1999	11	(of 60 cervical)	5%/0	(for entire series)
		84% primary	5 yr	reconstructions)
		90% assisted primary		
Irace et al, 2003	42	0/0	89% primary	12-80 mo
Ozsvath et al, 2003	24	1 (4%)	0	88% primary, 3 yr (mean)
		92% secondary		
Modarai et al, 2004	13	(of 35 cervical)	0/0	97% secondary 5 yr reconstructions)
Berguer et al, 1999	4	(of 182)	7 (3.8%)	1 (0.5%)
		91%, 82%	5 yr, 10 yr	reconstructions)
				for entire series

## References

1. Abou-Zamzam AM, Moneta GL, Edwards JM, et al. Extrathoracic arterial grafts performed for carotid artery occlusive disease not amenable to endarterectomy. *Arch Surg* 1999;134:952-7.
2. Irace L, Martinelli O, Stumpo R, et al. Carotid-carotid bypass. *Minerva Cardioangiologica* 2003;51:329-35.
3. Ozsvath KJ, Roddy SP, Darling C, et al. Carotid-carotid bypass: is it a durable procedure? *J Vasc Surg* 2003;37:582-5.
4. Modarai B, Ali T, Dourado R, et al. Comparison of extra-anatomic bypass grafting with angioplasty for atherosclerotic disease of the supra-aortic trunks. *Br J Surg* 2004;91:1453-7.
5. Berguer R, Morasch MD, Kline RA, et al. Cervical reconstructions of the supra-aortic trunks: a 16-year experience. *J Vasc Surg* 1999;29:239-48.