Value of Endovascular Interventions

When released, will the TASC III guidelines eliminate the discord with current clinical practice?

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The growth of endovascular interventions is linked to the positive outcomes and value these procedures provide to patients. Physicians are increasingly recommending an endovascular-first revascularization strategy when combined medical treatment and exercise fails in achieving the desired outcome. The publication of consensus guidelines advocating the use of endovascular interventions in treating peripheral arterial disease (PAD) has accelerated the adoption of this less invasive treatment alternative.[1] This article highlights the value drivers for endovascular interventions and discusses a potential shift in future volumes.

INCREASING TECHNOLOGY ADOPTION

In the March 2013 edition of *Endovascular Today*, Brian Contos of The Advisory Board Company authored an informative article on the growth of endovascular services and specifically detailed the 67% increase in lower extremity arterial angioplasty procedures between 2005 and 2011.[2] The article identified select technologies that were enablers of the procedural growth and the resulting outcomes that truly drive increased utilization of endovascular interventions. When innovative medical devices fail to produce the desired and anticipated outcome, physicians will swiftly evolve their practice pattern away from the technology. The key to increased adoption of next-generation technologies is the development of a comprehensive evidence base during both product development and the initial launch phase. Comparative effectiveness research of competing interventions or technologies is very influential with physicians, payers, and hospital providers. A positive recommendation in a consensus guidance document leads to broad market access.

FORMATION OF TASC

More than a decade ago, the predominant treatment for symptomatic PAD involving lesions in the femoropopliteal region was bypass surgery and, if symptoms were severe enough, amputation. Endovascular treatment options were not available. The Transatlantic Intersociety Consensus (TASC) was established soon after and provided the first consensus guideline on PAD, focusing on symptomatic rather than asymptomatic patients.[3] With the advancement of endovascular techniques, the Intersociety Consensus for the Management of Peripheral Artery Disease (TASC II) consensus process started in 2004, aiming to reach vascular specialists and primary care physicians globally.[4] The goal of these guidelines was to provide a truly international consensus on the diagnosis and management of PAD. The fact that endovascular revascularization is increasingly recommended and used for treatment of lower extremity lesions in patients with PAD is primary evidence that the targeted outcomes are being achieved (Table 1).

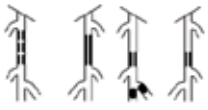
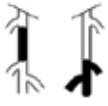
ENDOVASCULAR ADVANTAGES

The use of these minimally invasive devices and procedures is attractive to patients when compared to surgical interventions, which are accompanied by increased risk and need for recovery time. This is especially true for patients with critical limb ischemia (CLI), for whom in the past the only option was to undergo surgery or amputation. When considered in combination, the advancements in endovascular techniques have coincided with an increase in the use of endovascular approaches over time, as evidenced through observational data.[1] In this 12-year retrospective single-center study, the percentage of revascularization procedures being performed using the endovascular method ranged from 0% in 1999 to 89% in 2010. In 2005, the split between open surgical and endovascular revascularization was essentially equivalent.

Lower extremity bypass surgery, compared with endovascular interventions, may pose an increased procedural risk due to the invasiveness involved. This may be evident in older patients with more advanced disease and comorbid conditions. This population is also more likely to have severe PAD and complex lesions for which guidelines may recommend surgery.

TABLE 1. CURRENT TASC II GUIDELINES AND TREATMENT OF FEMOROPOPLITEAL LESIONS

A technical update known as TASC IIb was presented based upon newer clinical data but never published, as physician consensus was not achieved. Discussions are ongoing for the creation of TASC III, but a definitive publication date is not currently available.[5] One of the central questions anticipated to be answered with TASC III is whether the available evidence base supports creating a formal recommendation for endovascular interventions on type C and D lesions.

Femoropopliteal Lesions		
Lesion Type	**Lesion Characteristics**	**TASC II Guidelines Recommendation**
Type A Lesion 	Single occlusion ≤ 5 cm in length	Endovascular
	Single stenosis ≤ 10 cm in length	
Type B Lesion 	Multiple lesions (stenosis or occlusions), each ≤ 5 cm	Endovascular[a]
	Single stenosis or occlusion ≤ 15 cm not involving the infrageniculate popliteal artery	
	Single or multiple lesions in the absence of continuous tibial vessels to improve inflow for a distal bypass	
	Heavy calcified occlusion ≤ 5 cm in length	
	Single popliteal occlusion	
Type C Lesion 	Multiple stenosis or occlusion totalling > 15 cm with or without heavy calcification	Bypass surgery[a]
	Recurrent stenosis or occlusion that needs treatment after two endovascular interventions	
Type D Lesion 	CTO of CFA or SFA (> 20 cm, involving the popliteal artery)	Bypass surgery
	CTO of popliteal artery and proximal trifurcation vessels	

Adapted from Norgren L, Hiatt WR, Dormandy JA, et al. Inter-Society Consensus for the Management of Peripheral Arterial Disease (TASC II). Eur J Vasc Endovasc Surg. 2007;33(suppl 1):S1-75.[4]

[a]Patient comorbidity, fully informed patient preference, and local operator long-term success rates must be considered when making recommendations.

Compared to endovascular management, several studies show a greater complication risk with bypass surgery in those with lower extremity lesions. Complications may extend the patient's length of stay, increasing the consumption of hospital resources. Nonfatal complications can often reduce patient quality of life. Certain procedure-related complications (eg, myocardial infarction) may reduce life expectancy considerably.

Hospital providers and physicians seeking to demonstrate the value of endovascular techniques will require a current comparison of total costs versus surgery, paying particular attention to the initial procedure-related costs and tracking the potentially lower risk of complication-associated costs such as surgical site infections. These lower costs may more than offset reintervention costs to maintain patency. The likelihood of total costs being lower for endovascular procedures increases in populations where primary patency is expected to be similar for both the minimally invasive and open surgical modalities. Studies focusing on the initial episode of care related to the hospitalization fail to track the downstream costs associated with each revascularization option.

CONCLUSION

In the recommended treatment populations, endovascular interventions provide a practical treatment alternative for patients failing to respond to medical treatment and exercise. The utilization of a minimally invasive procedure to alleviate symptoms as compared to surgical bypass creates value by reducing the complication risks such as surgical site infections. As newer clinical study data become available, the recommendations for the types of lesions that should be managed with endovascular techniques may be expanded to include type C and D lesions. ■

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