In our prior review of 34 popliteal artery aneurysms (PAA), we suggested that small PAA's were associated with higher incidence of thrombosis, clinical symptoms, and distal occlusive disease. This was based upon the liberal use of duplex scanning to make the diagnosis. We concluded that small PAA (<2.0 cm) may not be as benign as previously suggested. Symptomatic PAA were significantly smaller than asymptomatic aneurysms (p < 0.03). The majority of the small aneurysms (64%) in this series were partially thrombosed and this incidence was not significantly different from that of larger aneurysms (70%). Complete thrombosis of the PAA did not correlate with aneurysm size. When comparing runoff scores, these smaller symptomatic PAA had poorer outflow vessels. These data suggest that size alone does not correlate with the presenting symptoms of PAA. The presenting symptoms or lack thereof did not correlate with the prevalence of diabetes, location of the PAA, or degree of superficial femoral artery disease. Despite their small size, these aneurysms can be lined with thrombus that can embolize to the infrapopliteal arteries. We suggested that small popliteal aneurysms in patients with low operative risk, acceptable runoff and adequate venous conduit should be considered for repair. This is especially true if duplex imaging demonstrates mural thrombus. While admittedly there is no prospective evidence that mural thrombus is an indication for repair, we suggest that these data indicate that mural thrombus may be the main source of symptoms and limb loss. This is especially true as the morbidity and mortality of repair has decreased with the advent of minimally invasive techniques.

In Dr. Galland’s 2005 paper, he stated that his data examining 116 PAA found that “size was not significantly different between the two groups” (asymptomatic and symptomatic). Therefore, it would be difficult to justify the topic assigned to Dr. Galland of “Asymptomatic popliteal artery aneurysms <3 cm should be treated conservatively” based upon his data. However, if PAA were >3 cm and if distortion of the proximal artery >45° was found, then a positive correlation was found with the presenting symptoms. While we cannot compare whether distortion was observed in our patients with PAA with mural wall thrombus or whether mural wall thrombus was noted in the patients with distortion in the series of Dr. Galland, it is possible there may be some overlap between the subsets. These data have the same limitation as our dataset as they correlate the presenting symptoms with the anatomy of the lower extremity arteries in a retrospective fashion. Ideally, we should obtain data that prospectively help guide the management of patients with PAA. Interestingly, there have been no reports in the ensuing years from other centers confirming or denying these findings.

These comparisons highlight the need for modern series with longitudinal prospective data to explore issues of natural history or PAA. Many of the prior data weighed the risks of open bypass as compared to endovascular repair which in some centers has been the first line therapy. On the other hand, Dr. Galland’s group have suggested that endovascular repair of PAA is associated with a longer procedure, higher thirty day reintervention rates and similar long term primary patency rates. Five of the 37 endovascular repairs in this series were performed with Wallgrafts which may make the dataset some what outdated. This data are also in contrast to ours suggesting endovascular repair is a shorter procedure and its patency rates rival that of open repair. The marked reduction in morbidity of endovascular PAA has assured its place in our armamentarium in the treatment of PAA and suggests that prior attempts of comparing the risks versus benefits of open surgical repair of PAA need to be modified in the present modern day era.

Based upon these data, we suggest the need for other centers to examine their data, especially focusing on prospective longitudinal data to help answer some of these unresolved questions. While many questions about the management of PAA do remain, we maintain that some patients with PAA less that 3 cm especially with mural thrombus should be repaired either with open or endovascular methods.

References

Part Two: Against the Motion

EDITORS’ COMMENT

Nonoperative Versus Surgical Management of Small (Less than 3 cm), Asymptomatic Popliteal Artery Aneurysms

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The decision to treat a popliteal aneurysm requires weighing the risks and results of treatment against the risks of continued follow-up. Like aortic aneurysms, popliteal aneurysms may cause no symptoms for an extended period, but, unlike their aortic counterparts, are more likely to present with an ischemic complication rather than rupture. Dawson et al.1 have underscored the danger of critical limb ischemia and limb loss in untreated popliteal artery aneurysms. Interestingly, this paper reported that 40% of asymptomatic patients with a popliteal aneurysms will have absent pedal pulses, which adversely affect the natural history with a likelihood of symptoms developing of 86% at 3 years as compared with 34% in asymptomatic patients with intact pulses.

Both of our debaters agree that it is problematic to base treatment decisions on diameter alone, as opposed to the situation with abdominal aneurysms where there exists a tighter linkage between aneurysm complications and diameter. In this debate, Dr. Hingorani develops these arguments for early intervention on small asymptomatic popliteal aneurysms based on long-term graft patency and limb salvage rates that are usually greater than 95% when using a saphenous vein, and a low perioperative mortality rate of around 1–2%.

In opposition, Professor Galland suggests that many asymptomatic aneurysms of 3 cm in diameter can be safely observed. The arguments for this approach are based on the observation that asymptomatic aneurysms without intramural thrombus or distortion from excessive tortuosity and with intact distal pulses rarely cause symptoms. Moreover, although results with surgery have generally been excellent, complications and deaths have occurred, especially in patients with no saphenous vein available, severe co-morbid conditions or those who are very elderly.

But both debaters agreed that the results of surgical treatment are best in asymptomatic patients and progressively worse in those with chronic ischemic symptoms and critical limb ischemia. Without the results of a multicenter prospective randomized trial, the decision regarding treatment remains one of clinical judgment and must be individualized to the specific patient and clinical situation. Moreover, many of the previous arguments were based on results in the era before endovascular therapy. For young active patients early bypass using a saphenous vein is certainly a valid option, in frail patients with limited life expectancy, observation of even large aneurysms with minimal intraluminal thrombus, palpable distal pulses, and no evidence of continued expansion can be proposed. When treatment is required in this older and frailer subset of patients, endovascular repair could be considered the preferred method of repair providing there is favorable anatomy.

Reference