sues. Consequently, electrocautery artefacts may severely limit assessment of the margins of excision when mammary carcinoma is to be treated by limited resection and primary radiotherapy. When breast conservation is being considered, the margins of excision is regarded to be important since mastectomy may be recommended to some patients with positive margins or they may receive an additional radiation “boost” to the biopsy site.1,2

When excision of carcinoma is carried out with little or no surrounding breast parenchyma, thermal damage may occur in the tumor itself. This may be a particularly serious problem in the excision of recurrent or metastatic lesions such as skin nodules and lymph node metastases. The histological effects may interfere with the assessment of microscopic prognostic features of the primary tumor such as nuclear and histologic grade. Damage to cells within ducts may make it impossible to determine whether intraductal carcinoma is present in tissue outside the tumor mass, an observation that has been used to predict the likelihood of recurrence at the primary site in the breast.3

The thermal effect may produce other significant changes in the tissues. Reduced estrogen receptor activity has been described in tissues excised by electrocautery.4,5 In a number of instances, the decrease in receptor activity can be sufficient to result in a false-negative report. We have confirmed this phenomenon in a small series of surgically excised specimens. The tumor samples were divided and one portion briefly treated with electrocautery. Cytosol receptor activity was consistently lower in the cautery exposed sample. Estrogen, progesterone, and androgen receptors were strongly positive in the uncauterized sample in one case but were negative in cautery exposed tissue from the same tumor.

Histochemical study of prostate and breast specimens after electrocautery treatment reveals a decrease in cytoplasmic fluorescent steroid binding and a concomitant increase in fluorescent nuclear activity.4,5 It has been suggested that the reduction in measurable cytoplasmic estrogen receptor caused by electrocautery is due at least in part to redistribution of the protein to nuclei as well as thermal destruction of receptor.

Surgeons should be aware of these complications of the use of electrocautery in breast surgery. While there are advantages to the use of these instruments for breast biopsies, the potential detrimental effects must also be considered. In general, it would seem preferable to avoid the risk for introducing the thermal alterations of electrocautery whenever possible.

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References

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Dear Editor:

Dr. Tilanus and his colleagues concluded that the saphenous vein is by far superior to PTFE as a femoropopliteal bypass, largely on the basis of a relatively low 5-year cumulative patency rate for PTFE of 37%.5 What is most interesting, however, is their 1-year PTFE patency rate of only about 43%. Such a low first-year success rate for PTFE is unusual for a group of patients

Fig. 3A and B. A breast biopsy performed in a 46-year-old woman with a suspicious mammogram. A. Moderate thermal damage in a lobule. This is most likely normal or mildly hyperplastic tissue. B. Small duct with extreme thermal damage. The epithelium is uninterpretable.
characterized by 46% with intermittent claudication, 29% with rest pain, and 25% with tissue loss. Several larger studies have reported 1-year cumulative patency rates of greater than 75% for combined above- and below-knee femoropopliteal bypass with PTFE2-4 in patients at greater risk than those of Tilanus and colleagues.

The decision of Tilanus and colleagues to use only 8 mm grafts is unique in the literature and in sharp contrast to those who achieved better results using only 6 mm grafts or smaller 6.5–4.5 mm tapered grafts.2,4 While the authors based their decision to use 8 mm grafts on the rapid intimal thickening they observed on 4 mm grafts in dogs, the recent work of Camilleri et al.5 demonstrates that in humans the luminal lining on patent PTFE grafts may range from only 0.01 to 0.05 mm at up to 5 years. In the absence of significant intimal thickening, the use of an 8 mm graft instead of a 6 mm graft could reduce graft blood flow velocity by over 40% if the flow rate is controlled by distal run-off resistance. Unnecessarily low graft blood flow velocity most likely would result in a high rate of early failures, as observed by Tilanus and colleagues.

Ever since Sauvage et al.6 first postulated the existence of a thrombotic threshold velocity (TTV), investigators have studied the significance of graft diameter7 and tried to measure TTVs for various graft materials.8,9 Sauvage et al.10 and Christenson et al.8 both measured similar TTVs for PTFE of 5.5 cm/sec and 5.1 cm/sec, respectively. This translates to a critical flow rate of about 160 ml/min for an 8 mm graft, or 90 ml/min for a 6 mm graft.

The results of Tilanus and colleagues suggest that 8 mm PTFE grafts should not be used for femoropopliteal bypass.

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References