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## NEW TECHNOLOGY IN THE CATHETERIZATION LAB

Revascularization by angioplasty has come a long way since it was first performed by Gruentzig in 1977. But angioplasty still has limitations, among them restenosis in 28% to 42% of patients and abrupt closure in 4% to 8%. The consequences of abrupt closure during balloon angioplasty include emergency bypass surgery in as many as one third of patients, myocardial infarction in about one third, and death in 5% to 10%, so there is little question of the need for improvement.

Significant new technologies have been developed for the catheterization laboratory since the mid-1980s. We can now select a specific intervention based on the clinical and anatomical situation. Among the newer treatment options are stents to prevent abrupt closure and restenosis, and laser atherectomy devices that pulverize and remove plaque. Our capacity to assess results has improved in the last 5 to 10 years. Whereas contrast angiography was our standard tool for visualization, we can now use angioscopy to look inside the vessel and intravascular ultrasound to assess wall morphology in two and three dimensions.

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### DIRECTIONAL ATHERECTOMY

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The likelihood of abrupt closure is lower with directional atherectomy because it provides a smooth surface by physically removing the atheroma. However, the rigidity of the device is a limitation.

Directional atherectomy is indicated in highly eccentric lesions and irregular complex lesions and is associated with relatively few complications. There may be less restenosis of treated proximal lesions in the left anterior descending artery and in saphenous vein grafts if the lesions are short. Lesions not treated previously have a restenosis rate of about 30%; the rate is higher in lesions that have been previously treated with atherectomy or angioplasty. Treatment of focal lesions is generally more successful than treatment of long lesions. We have not fully learned how to use this device; the issue of how much atheroma to remove is controversial.

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### ROTATIONAL ATHERECTOMY

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In rotational atherectomy, a burr-like high-speed drill (Rotablator) is used to debulk and pulverize the lesion. Emerging data suggest that in the treatment of calcified lesions its results are superior to those of angioplasty. The location of lesions makes a difference with this device. In terms of success and complications, the results have been better in the left anterior descending and circumflex arteries compared with the right coronary artery. It is considered as possibly the treatment of choice for heavily calcified and ostial lesions. The result is a smoother surface and lower incidence of abrupt closure than is seen with angioplasty.

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### CORONARY STENTS

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Coronary stents are permanent, implantable, coil-like devices that reestablish coronary flow; they are used to intervene in abrupt closure. The device is placed into the area disrupted by the balloon in angioplasty. It creates a scaffolding effect, which treats the closure and minimizes the need for bypass surgery and the likelihood of myocardial infarction. Data so far have recorded successful placement in 95% of the first 500 patients. Among patients with successful placement after arterial closure, bypass was needed in 6% (and two of these procedures were elective).

Stents are somewhat thrombogenic and require vigorous anticoagulation; bleeding severe enough to require transfusion occurs in 10% to 15% of patients, although this relatively high percentage may represent a "learning curve." Although restenosis occurs at 6 months in 40% to 50% of patients, the trade-off is an indolent problem rather than an emergency. The technique is currently indicated for lesions in nearly all arteries of consequence. It will minimize the need for bypass surgery, but with a higher risk of bleeding and thrombogenesis.

Coronary stents are also being investigated to reduce the 30% to 40% incidence of restenosis or delayed recurrence of blockage after balloon angioplasty. Preliminary data are quite encouraging.

## TRANSLUMINAL EXTRACTION

The transluminal extraction catheter grinds up the lesion and aspirates the debris, creating larger particles than rotational atherectomy. It is best used for saphenous vein grafts that are diffusely diseased. Although the immediate results are somewhat better than those seen with angioplasty, the restenosis rate is still 40% to 50%. It is indicated for patients who are not good candidates for repeat bypass surgery.

## COMMENT

Restenosis, the major problem in revascularization, develops because of multiple mechanisms. For example, elastic recoil is a factor in 30% to 40% of cases of restenosis. The healing process itself also plays a contributing role. Mechanical devices may be beneficial, but all of these mechanisms may not respond to purely mechanical solutions.

Balloon angioplasty is still a versatile and robust technique and will be the mainstay of revascularization therapy for several years. However, other devices will find greater utility in specific situations and ultimately each will have its own niche—for example, the Rotablator for calcified lesions, directional atherectomy for highly eccentric lesions, and the transluminal extraction catheter for diffusely diseased vein grafts. Backing up all of these is the possibility of stenting for abrupt closure.

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## SUGGESTED READING

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## A CHECKLIST OF COMMON ORAL MANIFESTATIONS OF HIV INFECTION

The range of diseases that can present in the patient infected with the human immunodeficiency virus (HIV) demands a multidisciplinary approach to diagnosis, staging, and treatment. And because the earliest manifestations of HIV-related disease often appear in the oral cavity, an oral examination is an essential aspect of the workup of all patients known to be HIV-positive.

At least 40 oral manifestations of HIV have been recorded. Those appearing most frequently can be detected by dentists and physicians who are sensitive to the breadth and prevalence of the disease. Periodontal disease is common in these patients, despite good oral hygiene, and warrants intervention by a dental practitioner.

The following brief checklist outlines the clinical presentation and treatment of some common oral manifestations of HIV.

## ORAL CANDIDIASIS

Candidiasis is the most common infection to present in the oral cavity, and the atrophic form is the usual manifestation. Chronic hypertrophic, pseudo-membranous (thrush), and angular cheilitis forms also can occur. Any of these suggest the development of immune system dysfunction, and they are sometimes the only early signs. When these lesions are biopsied, they are usually positive for candidiasis.

The classic hypertrophic form affects the hard and soft palate and the oropharyngeal region. It is relatively easy to diagnose. More subtle presentations are erythema of the hard palate, dilated minor salivary glands (seen in heavy smokers as nicotine stomatitis), and clusters of "smoke rings" on mucosal tissue. All of these should raise the index of suspicion for HIV infection in an undiagnosed patient, and a smear or biopsy should be sent to the cytology laboratory. As HIV infection progresses, candidiasis may present as "hairy tongue," an elongation of filiform papilla of the dorsum of the tongue.

Nystatin oral pastille, 200,000 units three to five times a day, is the initial drug of choice for candidiasis. Nystatin vaginal tablets, 100,000 units dissolved in the mouth tid, can also be effective. If nystatin fails to

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