

14.3

CLINICAL APPLICATION

THE RETURN OF THE MEDICINAL LEECH

It had taken surgeon Joseph Upton ten hours to sew the five-year-old's ear back on, after a dog had bitten it off. At first the operation appeared to be a success, but after four days, trouble began. Blood flow in the ear was blocked. Close examination showed that the arteries that the surgeon had repaired were fine, but the smaller veins were becoming congested. So Dr. Upton tried an experimental technique—he applied twenty-four leeches to the wound area.

The leeches latched on for up to an hour each, drinking the boy's blood. Leech saliva contains several biochemicals, one of

which is a potent anticoagulant called hirudin, in honor of its source, the medicinal leech *Hirudo medicinalis*. Unlike conventional anti-clotting agents such as heparin, which are short-acting, hirudin works for up to twenty-four hours after the leech has drunk its fill and dropped off. Hirudin specifically blocks thrombin in veins. The long-acting leech biochemical gave the boy's ear time to heal.

Leeches have long been part of medical practice, with references hailing back to the ancient Egyptians 2,500 years ago (fig. 14B). The leech's popularity peaked in Europe in the nineteenth century, when French physicians alone used more than a

billion of them a year, to drain “bad humours” from the body to cure nearly every ill. Use of leeches fell in the latter half of the nineteenth century. They were rediscovered by Yugoslav plastic surgeons in 1960 and by French microsurgeons in the early 1980s. In 1985, Dr. Upton made headlines and brought leeches into the limelight by saving the boy's ear at Children's Hospital in Boston.

A leech's bite does not hurt, patients say. But for those unwilling to have one or more 3-inch long, slimy green-gray invertebrates picnicking on a wound, hirudin is also available as a drug called hirulog, produced by recombinant DNA technology (fig. 14C). ■



FIGURE 14B

For centuries, bloodletting with leeches was believed to cure many ills. This woman in seventeenth-century Belgium applies a medicinal leech to her arm.



FIGURE 14C

Microsurgeons sometimes use leeches to help maintain blood flow through veins in patients after reattaching severed ears or digits. An anticoagulant in the leech's saliva keeps the blood thin enough to flow. © Biopharm (USA) Limited 1994.