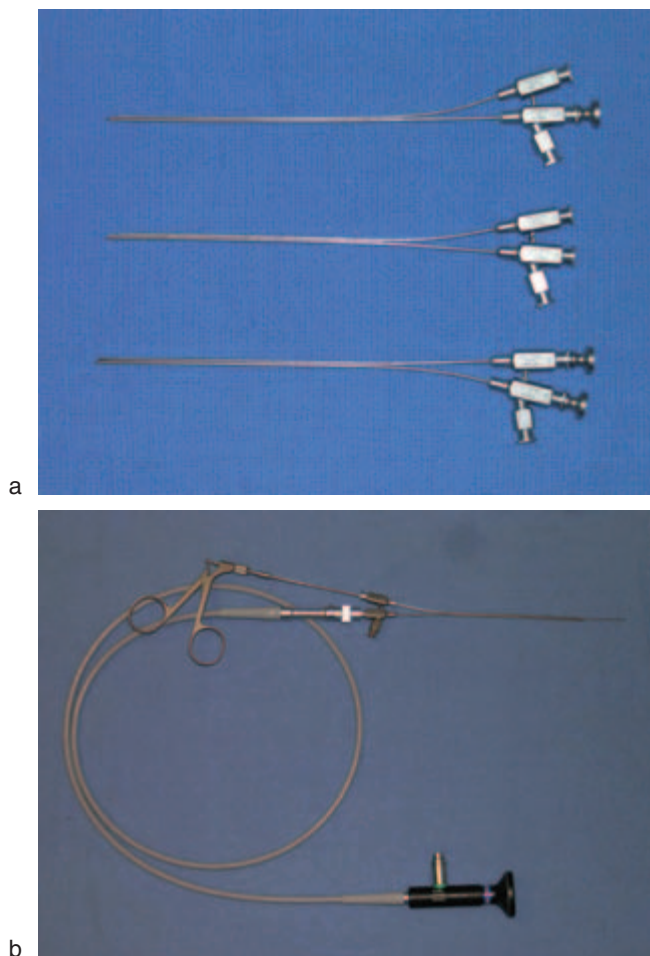


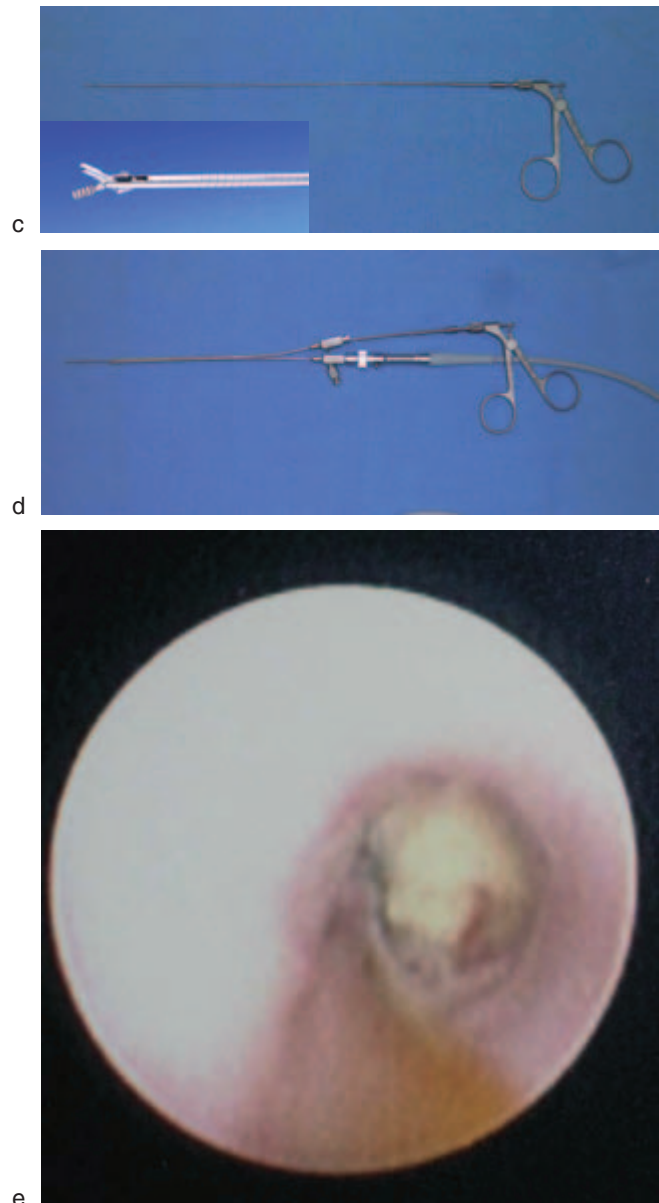
Intracorporeal lithotripsy techniques are now used in which a miniature endoscope is utilized to manipulate the stone under direct vision. In this technique, shockwaves are applied directly to the surface of the stone under endoscopic guidance. The shockwave may be derived from an electrohydraulic source, a pneumoballistic source, or from a laser. Pneumoballistic energy has been shown to produce calculus fragmentation with greater efficiency than lasertripsy (Arzoz et al. 1996). The disadvantage of these techniques is that the size of the endoscope and probe requires that the duct be incised so as to facilitate entry.

Finally, interventional sialoendoscopy has been developed that may permit the use of a fine

sialoendoscope to retrieve salivary stones (Nakayama, Yuasa, and Beppu et al. 2003) (Figure 5.13). The size of some sialoliths, however, is such that an incision of the papilla may be necessary for their delivery. Interventional sialoendoscopy may be used with lithotripsy to fragment large



**Figures 5.13a and 5.13b.** Interventional sialoendoscopic instrumentation for retrieval of salivary calculus, including the operating sheaths (a) that accept the miniature endoscope (Karl Storz Endoscopy-America, Inc., Culver City, California) in the *telescope* channel (b).



**Figures 5.13c, 5.13d, and 5.13e.** The grasping forceps (c), are placed within the *working* channel of the operating sheaths (d), and are able to retrieve stones that may be identified on diagnostic sialoendoscopy (e). Figure 5.13e courtesy of Dr. Maria Troulis, Boston, Massachusetts.