Endosuites, through the presence of fixed equipment placement upon booms that do not require significant manipulation, ultimately preserve the equipment in the long term and ensure an efficient operating room environment (Fig. 33-1). Monitors can then be manipulated to a position at the eye level of each individual surgeon. This can avoid neck strain and cervical disk injury.

In addition, current systems (Stryker, San Jose, CA) may capture infrared emissions (for example, a bougie used for Nissen fundoplication or ureteral stents used for sigmoid colectomies). Also important, and particularly well illustrated in this book, is the capability to record surgical procedures. Multiple methods of final storage exist whether it be onto a DVD, CD (older versions), or USB flash drives.

The pneumoperitoneum provided by insufflators can be provided via high-flow tubing allowing for 40 L/minute, which is ultimately limited by the caliber of the connection to the trocar. The air can also be heated and humidified, although most studies do not show significant benefit. It should be noted that vigilance to ensure adequate patient paralysis by anesthesia and patient positioning to facilitate visceral retraction by gravity also assist significantly in visualization and performance of the intended procedure. Liver retraction can be done via many devices (Fig. 33-2) including the Soft-Wand balloon retractor (Gyrus-ACMI, Southborough, MA) or Nathanson retractor (Cook, Bloomington, IN) among others. This is frequently critical particularly in gastric bypass and other procedures performed at the hiatus. The balloon retractor can also be used to retract the mesocolon (in identifying the ligament of Treitz) or other structures atraumatically.

**TROCARs AND ABDOMINAL ACCESS**

Although Jonas Veress described his blunt spring-loaded needle in 1938, it was not until the 1980s that the Veress needle became routinely employed to achieve access into the abdominal cavity. After the needle enters the peritoneal cavity, the resistance to entry of the Veress needle subsides, resulting in protrusion of the blunt obturator shielding the sharp outer sleeve. Most often it is placed in the infraumbilical position, but it can be placed in the left or right upper quadrants immediately below the costal margin, making it especially useful in patients who have undergone prior surgeries. Although theoretically this will prevent injury to intra-abdominal viscera, in fact there still exists a low but significant risk. It is important to lift away the abdominal wall