(ii) Principles of endoscopic spine surgery

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INTRODUCTION

Laparoscopy became popular in the late 1980s, primarily as a result of the success of laparoscopic cholecystectomy. In 1988, Reddick demonstrated the vast improvement in return to work of 6.5 days with laparoscopy compared to 34 days for minilaparotomy for gallbladder disease. Within three years, 90% of cholecystectomies done in the USA were performed using endoscopic techniques. In laparoscopy, rather than transecting abdominal musculature, narrow portals are inserted to access the peritoneal cavity. Consequently, postoperative pain and recovery time are reduced, leading to shortened hospital stays and earlier return to work compared to open surgery. As a direct result of the early success of laparoscopy the modern era of thoracoscopy or 'video-assisted thoracic surgery' (VATS) began a few years later in 1990 with the addition of video to standard endoscopic techniques. In a study of patients undergoing lung biopsies, the thoracoscopic approach was associated with less pain, shorter hospital stay, decreased cost and earlier return to work when compared to open biopsy via thoracotomy. Anterior endoscopic spinal surgery was first described by Obenchain when he reported the first laparoscopic lumbar discectomy. The application of thoracoscopy for diseases of the spine was initially reported by us in 1993. More recently, we have reported preliminary results of laparoscopic fusion of the lumbar spine using a threaded fusion cage.

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INSTRUMENTED LAPAROSCOPIC FUSION OF THE SPINE

Although the laparoscopic approach to the lumbar spine was initially described by Obenchain for the treatment of lumbar disc herniation, more enthusiasm has been generated with regard to laparoscopic anterior interbody fusion of the lumbar spine. The laparoscopic fusion procedure, using the BAK threaded interbody fusion device, has recently been approved by the FDA. Patients are selected based on indications similar to those used for open techniques for lumbar interbody fusion at L4–5 and L5–S1. The primary indication for the procedure is in the patient with painful disc degeneration with neuroforaminal narrowing and radiculopathy. Patients with Grade I spondylolisthesis may also be considered for this procedure. The easiest level to access pathology through the laparoscope is L5–S1 because the bifurcation of the aorta and vena cava occurs above this disc space. The L4–5 disc can be exposed laparoscopically, but it is more difficult as a result of the necessary vascular mobilization. Most often, the left iliac artery and vein must be retracted to the right to place interbody fusion cages. Preoperative magnetic resonance images are helpful in determining the level of arterial and venous bifurcation. Laparoscopic access to discs above the L4–5 level is difficult because of viscera and vascular structures such as the inferior mesenteric artery and renal vessels. Contraindications to laparoscopy include morbid obesity, extensive peritoneal adhesions, active neoplasm or infection of the peritoneal cavity or medical illness that would preclude surgery.