

Modified Device-Free HAL: An Innovative Cost-Reductive Approach

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Abstract

Hand-assisted laparoscopy (HAL) has been in vogue since 1994. The major advantages are tactile sensation, quicker dissection, and easy removal of specimen. These advantages could not be availed in developing countries due to the cost of the available HAL devices. This has initiated the use of HAL without devices in our unit. Instead of a device, a double glove with a sponge between the inner and outer glove at the wrist acted as an obturating cuff. A muscle-splitting incision in the iliac fossa helped in minimizing the air leak. In this article, we report our experience in nephrectomy and nephroureterectomy.

Introduction

HAND-ASSISTED LAPAROSCOPY (HAL) has been used extensively in general surgery and gynecology since 1994. This was taken up by urologists after Nakada¹ reported HAL nephrectomy in 1997. HAL with or without a device has most of the advantages of open surgery, such as tactile sensation, quicker dissection, intact specimen removal, ability to apply digital pressure, quick learning curve, decreased operating room time, and shorter warm ischemia time for donor nephrectomy.²⁻⁴ These, however, are the limitations of pure laparoscopic surgery. In developing countries, the cost of the HAL devices has limited the use of HAL routinely.⁵ This has prompted us to develop HAL without devices.

Technique

The patient is placed in the 70-degree ipsilateral flank-up position without a kidney bridge. The hand incision for the transperitoneal approach is made in the ipsilateral iliac fossa (Fig. 1). This iliac-fossa incision admits the left hand of a right-handed surgeon in right nephrectomy. For a left-side nephrectomy, the assistant's right hand is used through the ipsilateral iliac-fossa incision. The length of the incision is made just enough to admit the wrist of the surgeon (approximately 5–6 cm). The muscle layers of the anterior abdominal wall are split after incising the external oblique aponeurosis (Fig. 2). The peritoneum is incised just enough to admit the hand. A pad is wrapped around the wrist over a glove (Fig. 3), and a second glove is worn over the pad with

the inner glove (Fig. 4). The pad is folded in such a way that it makes a smooth gradient. Along with the tone of the muscle-splitting incision, the pad folded around the wrist aids in reducing the air leak. Lubricant jelly is applied to the hand to aid insertion and enable a back-and-forth movement of the hand (Fig. 5). With hand guidance, the other ports are inserted. The camera port is placed 3 cm above and lateral to the umbilicus in the pararectus area. Two working ports are placed in the subcostal region in the midclavicular line and flank in the anterior axillary line at the level of the umbilicus (Fig. 6). Taking a mop or a bulldog clamp through the hand incision is not cumbersome. Decompression of the pneumoperitoneum occurs whenever the hand is removed. However, this quickly refills without much loss of time. Mobilization of the kidney and control of the pedicles are done in the usual manner (Fig. 7). Nephrectomy is completed and the specimen is removed through the hand-incision site. The incision is closed with interrupted sutures.

Discussion

Since 2006, 5 patients have undergone deviceless HAL nephrectomy and 2 patients have undergone deviceless HAL nephroureterectomy. The operative time ranged between 110 and 140 minutes. Patients stayed in the hospital for 5 days. There was no intra- or post operative morbidity. The major advantage of the deviceless technique of HAL is cost reduction. The initial setup and introduction does not take up time as in the HAL devices. There is no restriction of hand movement as in some of the HAL devices. Introduction of