

A Broken Cautery Tip Lost in the Abdomen at Laparoscopic Ovarian Cystectomy

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Abstract

Losing a part of a hand instrument at laparoscopy is rare and retrieval can be taxing and time consuming. Given their rare occurrence, no standardized management protocol for such cases has been developed. Electrocautery continues to be the most commonly used energy source in endoscopic surgery. We present the intraoperative loss of the distal tip of a bipolar cautery hand instrument in the abdominal cavity at laparoscopic ovarian cystectomy and discuss the genesis and retrieval methods.

Keywords

Bipolar cautery tip; Laparoscopy; Retrieval; Lost

Introduction

Laparoscopic surgery has made huge advancements in last two decades. Benign ovarian cysts are being commonly managed laparoscopically. Ovarian cystectomy by this mode has been reported to preserve ovarian reserve well in addition to laparoscopy offering the advantages of less blood loss and shorter hospital stay. As for any other surgical procedure, the procedure is not without complications, which occur in around 0.2-10.3% cases [1]. Most complications relate to damage to nearby organs, thromboembolism, infection and cardiovascular compromise. Accidental breakage or loss of hand instruments in the abdominal wall or cavity is rare and retrieval can be stressing for the operative team. We report a case of loss of the tip of bipolar cautery within the abdominal cavity during laparoscopic ovarian cystectomy and its successful retrieval.

Case Report

A 28 years old parous woman reported to outpatient department with pain lower abdomen and secondary infertility. Systemic and abdominal examination was normal. A 10 X 10cm sized smooth cystic mass was felt through the right fornix on bimanual vaginal examination. Haematological and blood parameters were essentially normal. Ultrasound of pelvis revealed an echogenic mass of variable density and shadowing in the right ovary. Echogenic particles in a hypoechoic medium (dermoid mesh) and fat-fluid level suggested a right ovarian dermoid cyst. Computed tomography too indicated presence of fat contents, fat-fluid level, some calcification and tufts of hair.

She was taken up for laparoscopic cystectomy under general anaesthesia. The cyst was enucleated

successfully and ovarian bed was cauterised with bipolar cautery at the bleeding sites. The bipolar forceps was removed from the ancillary port and at this juncture, missing of the cautery tip (i.e. the two distal prongs) was noticed. The area of the abdomen under the ancillary port and the pouch of Douglas were inspected carefully but the broken cautery tip was not located. A reverse Trendelenberg position of the operating table was also tried so that the gut loops descend into the pelvis but to no avail. Irrigation of the abdominal cavity with saline was started and efforts were made to look beneath the gut loops with the scope. One of the broken prongs was located underneath the bowel loops above the sacral promontory, was grasped and removed through one of the ancillary ports.(Fig 1) Soon thereafter, the other broken prong could also be located and retrieved in the same manner. However when the second prong was being removed, the black insulation on the proximal part of the prong came off and fell into the abdominal cavity. It landed on a bowel loop, was visible and picked up and removed with a grasper. The retrieved parts appeared to constitute a complete bipolar tip. However, a portable X ray was also requested and done. To our surprise, the film revealed a circular metallic shadow on the left iliac bone which appeared unlike a bipolar tip. A thorough search was carried out in the drapes and on the table mattress which revealed an ECG electrode mistakenly sticking to the patient on the left lower back beneath the iliac crest. The enucleated ovarian dermoid cyst was retrieved with the help of an endobag. Patient fared well postoperatively and histology of the cyst confirmed its dermoid nature.

Discussion

It may be anticipated that a surgical item is less likely to be retained during laparoscopy than during laparotomy due to smaller incisions. This may hold true for complete instruments and large surgical mops but distal parts of the hand instruments and tiny gauge pieces passed through narrow sheaths can be lost in the peritoneal cavity or inserter sheaths at laparoscopy. Localisation and removal of lost items can be very taxing and time consuming. Apart from needles which are the most common items lost, distal part of suture passer or fascial closure device and a small sponge have been reported lost at laparoscopy [2,3,4]. Broken segments of the needles and the fascial closure device were lost in these cases while in our case the whole of the distal segment of the bipolar cautery hand instrument disengaged itself from the remaining instrument and fell off initially in two parts and later the second part also came off into two sub parts at retrieval thus suggesting lack of cohesiveness within the sub parts too. Repeated use and sterilization of very old instruments may play a role in weakening the joints. Soldered distal tips are also more easily breakable as soldering itself weakens the material of make.

Size of the lost item is the most important factor determining the success and duration of the retrieval process. Tiny parts of needles lost in the peritoneal cavity are difficult to identify on visual inspection as well on radiography. Needle pieces smaller than 13 mm may not be identified on radiograph [5]. However, Lynch et al reported localising a 2 mm fragment of broken needle tip in the Cooper's ligament on a radiograph at laparoscopic Burch procedure [6]. In our case, ample length and width of the lost item aided in its localization beneath the gut loops. Moreover, a heavier and blunt item is also more likely to drop beneath the intestinal loops than needles or their fragments which are not only lighter but are also more likely to pierce or get entangled in the gut wall or omentum.

Resistance encountered at insertion or removal of the instrument also may play a role in loosening, breaking off or slippage of an instrument segment. Suture passers are inserted directly

(percutaneously) through accessory port sites without the port cannula sheaths and thus encounter more tissue resistance than the instruments that are passed through the sheaths. This is evident from the more frequent observation of breakage of hand instrument tips of arthroscopy instruments which are commonly passed without a sheath [7]. Bipolar cautery is passed through a sheath and this factor does not appear to be operational in our case. However, even a mild twist or less than fully closed position of the distal segment at removal may aid detachment of an already weak joint in an old instrument and cannot be ruled out with certainty in the present case.

Whatever physical forces related to the instrument, surgeon or the passage come into play to cause the slippage or breakage event, the ultimate issue of retrieval remains common to all. Several methods have been tried for retrieval of the lost item without converting to an open procedure, if possible. Careful inspection of the operative field, specially under the ancillary ports, may be helpful if the loss has been detected immediately. Reversal of Trendelenberg position along with saline irrigation of the peritoneal cavity was tried in the present case thus combining the effect of gravity and floatation. A free metallic item with blunt ends may slip towards the pouch of Douglas in a head-up position along with the flow of fluid. The air containing gut loops float in the saline solution while the scope scans the area underneath. Radiographic localization of metallic objects has been commonly and successfully employed to locate metallic objects lost in the abdomen [2]. Addition of a staple or grasper to the operative field at radiography may help locate the lost object with greater precision. Creation of an abdominal grid by placing radio opaque gauge strings on the abdominal skin has been used by Ostrezensky et al. to locate the metallic tip on X-ray [8]. Kadioler- Eckersberger et al described use of a magnetic probe attached to a Teflon rod passed through one of the ports and placed in the vicinity of the lost part under fluoroscopic guidance for retrieval [9].

Maintenance of the delicate and complex hand instruments used in endoscopy requires special care and should be done as outlined by the manufacturer. Instruments should be sorted and those with multiple parts instruments disassembled for cleaning the nuts, washers or screws. Immersion of these instruments in clean water and neutral pH detergent immediately after use prevents drying up of soil on them. High pH detergents may dissolve the fibrin filaments and damage the material of make. Cleaning method used may be manual or mechanical. Ultrasonic washers or sprays may help remove soil from narrow areas of the instrument. Optical surfaces on the laparoscope should be cleaned with mild detergent and finally rinsed with purified water. Wetting the internal channels or electrical connections should be avoided for fear of causing permanent damage to it and risk of serious burns to the patient in case of damage to insulation.

The distal working tips of laparoscopic instruments are delicate and complex and may fall off or break during use. Utmost vigilance during the surgery should be supplemented with careful inspection of the tip on removal. Any deficiency on the tip should warrant a thorough search for the missing item in the peritoneal cavity, port sheaths and abdominal wall at port sites. Retrieval can be effected by radiography, a combination of reverse Trendelenberg position and irrigation of peritoneal cavity and use of a magnetic probe.

Figure



Figure 1: Intraoperative photograph showing one of the bipolar cautery tip prongs after it was located under the bowel loops during laparoscopic ovarian cystectomy.

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