




Intraoperative Dislodgment and Retrieval of Broken Parts of Laparoscopic Instruments: Arduous Exercise and Lessons Gleaned

Kusum Lata¹  · Akshita Panwar² · Isha Kriplani¹ · Alka Kriplani²

Received: 1 April 2020 / Accepted: 11 September 2020 / Published online: 3 November 2020
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Abstract

Background Dislodgement and breakage of instruments in laparoscopy is a rare event which not only surmounts the anxiety of the team, but also imposes an exceedingly onerous situation for the patient. Frequently a broken fragment of an instrument is confined to an area remote from the primary operative site and gets entrapped in the bowel loops or in the omentum.

Method We present the intraoperative loss of the distal tip of three 5-mm laparoscopy instruments (monopolar L-hook, myoma screw and tenaculum) in the abdominal cavity during endoscopy.

Result Various retrieval methods for laparoscopy instruments have been described.

Conclusion The distal working tips of laparoscopic instruments have delicate functioning and tend to fall off or break during usage. Maintenance of instruments used in endoscopy requires special care and should be done as outlined by the manufacturer. Reporting of such incidents should be encouraged and published despite the discomposure accompanying it as it aids in better understanding and learning to handle these situations.

Keywords Laparoscopy · Instruments · Retrieval · Dislodgement · Myoma screw

Kusum Lata is Assistant Professor, Department of Obstetrics & Gynecology, All India Institute of Medical Sciences New Delhi, India; Akshita Panwar, MD, DNB, MNAMS is Senior Resident, Department of Minimally Invasive Gynaecology, Paras Hospitals, Gurugram; Isha Kriplani is Senior Resident, Department of Obstetrics & Gynecology, All India Institute of Medical Sciences New Delhi, India; Alka Kriplani, MD, FRCOG, FICOG, FCLS, FAMS, FIMSA, FICMCH, Department of Minimally Invasive Gynaecology, Paras Hospitals, Gurugram.

✉ Kusum Lata
drkusumlata86@gmail.com

Akshita Panwar
akshipawar@gmail.com

Isha Kriplani
ishakriplani@gmail.com

Alka Kriplani
kriplaniaalka16@gmail.com

¹ Department of Obstetrics & Gynecology, All India Institute of Medical Sciences, Room no 3076, Third floor, New Delhi, India

² Department of Minimally Invasive Gynaecology, Paras Hospitals, Gurugram, Haryana, India

Introduction

Laparoscopic or minimal access surgery is now a standard and well-accepted route of all gynecological surgeries. The most obvious advantage for patients is the requirement of small incisions. It is important to emphasize that operative laparoscopy remains technically challenging as in minimal invasive surgery what is minimal is only the access; not the level of skill required, nor the rate or the degree of complications. 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 of nearby organs, thromboembolism, infection and cardiovascular compromise. Accidental breakage or loss of hand instruments in the abdominal wall or cavity is rare. We present the intraoperative loss and retrieval of the distal tip of three laparoscopy instruments (monopolar L-hook cautery, myoma screw and tenaculum) from the abdominal cavity during endoscopic procedures. Informed consent was taken from all three patients.

Case 1

Forty-eight-year-old women presented with abnormal uterine bleeding and was diagnosed to have adenomyosis by imaging with ultrasound scan. She received medical management in the form of oral progestones and tranexamic acid, but her symptoms were not relieved. In view of adenomyosis with failed medical management, total laparoscopic hysterectomy with bilateral salpingectomy was planned for her total laparoscopic hysterectomy with bilateral salpingectomy. Intraoperatively uterus was 14 weeks size with normal tubes and ovaries. Hysterectomy was completed successfully, and incising of vault with monopolar cautery was commenced. Monopolar L-hook was inserted in the upper left lateral port without any difficulty. The instrument was checked prior to the insertion and no flaw was found. Colpotomy was started with monopolar current from the left side and proceeded circumferentially over the Mangeshikar uterine manipulator when a vessel spurter started bleeding at the right uterosacral. Monopolar was extracted to secure the bleeder by the bipolar. However, at this point, missing monopolar cautery ceramic tip was noticed. A thorough search was done for misplaced tip inside the abdomen and pelvis, it was discovered in the stub (at the tip of cannula) of left upper lateral five-mm cannula from where the instrument was extracted (Fig. 1). The detached cautery tip was seized with grasping forceps introduced from opposite side and was kept in vision all the time. Nevertheless, the colpotomy was completed by another monopolar cautery introduced from right-sided port. After detaching uterus, it was removed vaginally, (Fig. 2) which was followed by extraction of the ceramic tip of our broken L-hook monopolar cautery.

The tip of cannula acts as a potential "trap" to catch fragments of instruments as well as specimens, highlighting

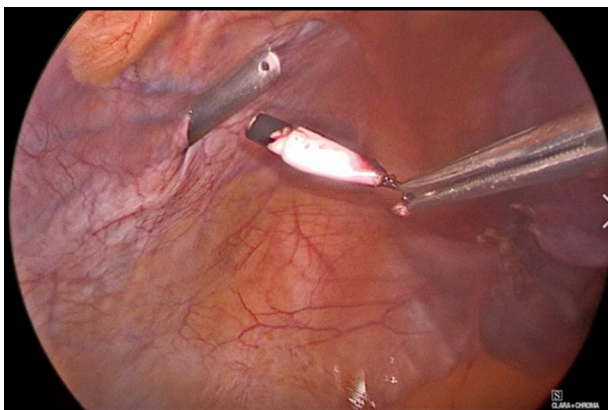


Fig. 1 Laparoscopic view of a broken monopolar L-hook ceramic tip being held in a grasper from the tip of 5 mm cannula.

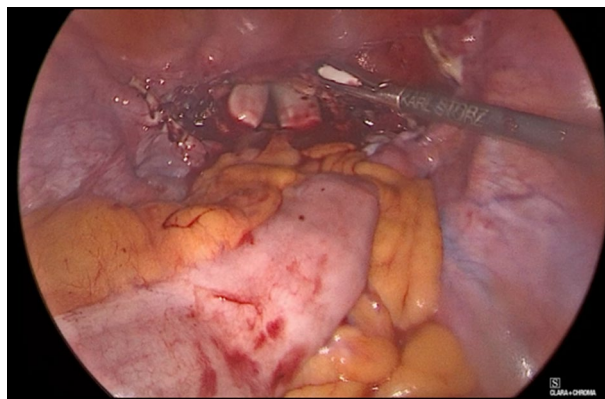


Fig. 2 Retrieval a broken monopolar L-hook ceramic tip from vaginal end

the importance of checking the cannula before performing radiological tests to locate broken instruments.

Case 2

Thirty-four-year-old women presented with infertility and abnormal bleeding. During workup, a posterior wall fibroid and right endometriotic cyst (6 × 6 cm) were found. She underwent laparoscopic myomectomy with right ovarian endometriotic cystectomy. While removing the posterior wall myoma 4 × 4 cm, tenaculum was used to provide traction. However, its tip got detached and swung away in the abdominal cavity (Fig. 3). After thorough exploration, it was found to be lying on the omentum and bowel at the sacral promontory. It was secured with bowel grasping forceps and an attempt was made to extract it through 5-mm port directly. This did not yield well as the long axis of the broken tip was horizontal and extracting from 5 mm port was not providing enough space for manipulation and removal. In order to avoid enlarging the incision, we thought of retrieving it

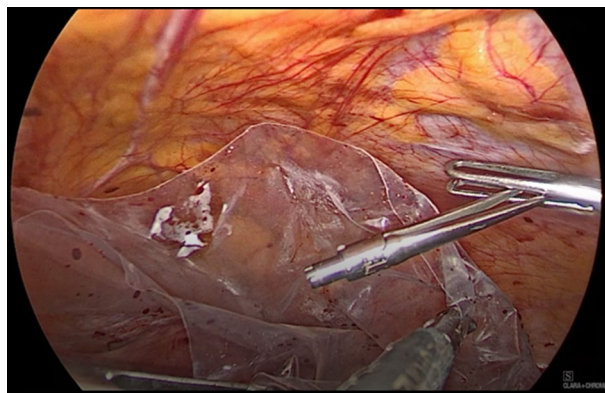


Fig. 3 Laparoscopic view of a broken tenaculum tip

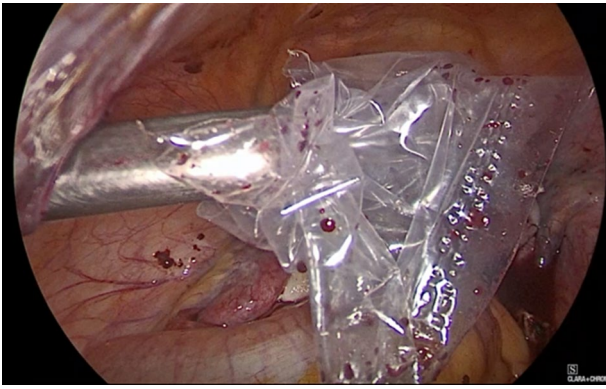


Fig. 4 Laparoscopic retrieval of a broken tenaculum tip in an indigenous bag from lower lateral port

in an indigenous endobag made from plastic cover of the TURP set (Fig. 4).

So endobag was inserted from 5-mm lower lateral port and tip of tenaculum was inserted and retrieved from the same port without any injury.

Case 3

Thirty-four-year-old nulliparous women presented with severe dysmenorrhea and inability to conceive from past 3 years. She was diagnosed to have multiple fibroids, and on examination, it was a 18-weeks size uterus. On imaging, multiple fibroids measuring 10×8 cm, 7×6 cm, 4×4 cm in size were seen on posterior, right lateral and anterior wall of uterus, respectively. Laparoscopic myomectomy along with chromopertubation was planned for her. While applying counter traction on myoma, it was noticed that tip of myoma screw has been dislodged (Fig. 5). Maneuvers by changing the position to Trendelenburg position with a right tilt and also irrigating the upper abdominal cavity with saline were attempted. Gut loops were traced and uplifted, and abdominal cavity was explored which all proved futile.

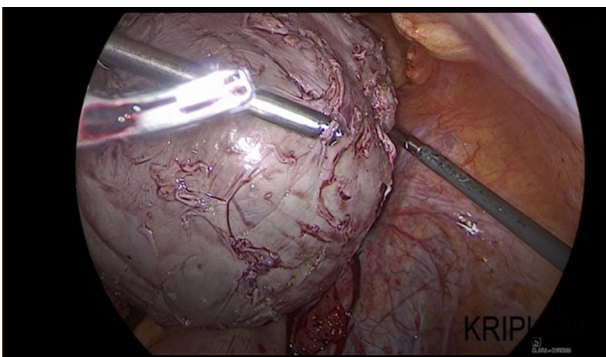


Fig. 5 Broken myoma screw with absent tip, possible due to pressure of the cannula while giving traction



Fig. 6 Fluoroscopic image while locating the broken myoma screw tip in the abdomen

Intraoperative portable C-arm fluoroscopy identified the missing piece far away from the original surgical site and revealed a fair outline of a metallic object in the left hypochondrium (Fig. 6). Real-time images were obtained and broken tip localized by fluoroscopy. Concurrently, tip was not located laparoscopically at the same spot which was demarcated by C-arm. Meanwhile, patient's attendants were informed about the situation and informed consent was taken. Hence, hand-guided retrieval of tip of screw was performed by extending incision on lower lateral port (Fig. 5). The hospital authorities were notified, and a formal complaint was made to the manufacturer (Fig. 6). Operative time was increased additionally by 30 min.

Discussion

Dislodgement and breakage of instruments in laparoscopy is a rare event. These incidences occur more commonly in situations where a good amount of traction is required like in large myomas or in patients with previous surgeries where one may encounter extensive fibrosis or adhesions. There are few similar case reports in literature where needles, distal part of suture passer or fascial closure device has been reported lost at laparoscopy [2–4]. It is very difficult to comment on the number of cases performed with these instruments individually as we have three sets of instruments at our center. We have a high-volume center with 80–90 laparoscopy cases/month; however, the instruments which got broken were being used for over a year.

In our case, the whole of the distal segment of the monopolar L-hook cautery and tenaculum instruments disengaged from the remaining instrument and fell off in the abdominal cavity. The retrieval of above instruments can be very troublesome and depends upon the size of the

broken part. Needle pieces smaller than 13 mm may not be identified on radiograph [5]. Lynch et al. reported localizing a 2-mm fragment of broken needle tip in the Cooper's ligament on a radiograph at laparoscopic Burch procedure [6]. In our case, longer and distinct tips of monopolar L-hook and tenaculum were identified. However, sleek tip of myoma screw got splintered in left hypochondrium that required fluoroscopic removal.

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. Radiographic localization of metallic objects has been commonly and successfully employed to locate metallic objects lost in the abdomen [7]. To aid in precision of detection, sometimes a metal instrument is placed on abdomen to facilitate location of lost part. Ostrezensky et al. described a unique method of using a radiopaque grid, to facilitate location of the broken instrument by placing radio opaque strings on the skin of the abdominal cavity during fluoroscopy [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].

Conclusion

The distal working tips of laparoscopic instruments have delicate functioning and tend to fall off, detach or break during usage. Maintaining instruments used in endoscopy require special care and should be done as outlined by the manufacturer. Reporting of such incidents should be encouraged and published despite the discomposure accompanying it as it aids in better understanding and learning to handle these situations.

Lessons Learned

1. Instruments, especially, those designed for multiple use, should be checked before introducing them into the surgical field.
2. Avoid panic and any deficiency on the tip should warrant a thorough search for the missing item at port sites first followed by port sheaths, the peritoneal cavity and abdominal wall.
3. Operative field radiopaque markers, e.g., instruments or grids during fluoroscopy, may aid in the localization of the broken instrument.
4. Operative notes and documents should be complete to avoid any medicolegal dispute later on.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Informed consent Informed consent was obtained from all individual participants included in the study.

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About the Author



Dr. Kusum Lata is an Assistant Professor in the department of obstetrics and gynaecology, AIIMS, New Delhi. She has done her MD from PGIMER, Chandigarh and senior residency from AIIMS, New Delhi following which she served Pt. B. D. Sharma Post Graduate Institute of Medical Sciences, Rohtak, Haryana as Assistant professor for 2 years. She has worked as a consultant in Minimal Invasive gynaecology in Paras Hospitals Gurgaon. She has special interest in gynaecology and laparoscopic surgeries.