Endoscopic Needle Knife Sphincterotome—an Alternative for Retrieval of an Entrapped Nasogastric Tube

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Abstract Knowledge of the use of a nasogastric tube (NG) is integral in medical practice as a whole and more so in gastrointestinal diseases because of its wide range of uses. Accidental fixation of the nasogastric tube during surgery is a rare complication. Various methods have been described for retrieval of an entrapped, retained or stapled nasogastric tube. We describe here a novel technique in which an endoscopic needle knife sphincterotome using a side-view endoscope was used successfully to cut the knots and release the entrapped NG tube. Although stress should always be laid on prevention, the flexible endoscopic approach is a small-duration procedure, a minimally invasive, cost-effective technique for the removal of a nasogastric tube that avoids the need of redo surgery and unnecessary exposure to anaesthesia.

Keywords Endoscopic · Needle knife · Sphincterotome · Entrapped · Nasogastric tube

Introduction

The nasogastric (NG) tube has become a frequently used method of alleviating gastrointestinal symptoms and has been used in surgical patients for gastric decompression, enteral feeding, diagnosis and assessment and administration of medications. Numerous complications are reported that include pharyngeal discomfort, erosion of nares, sinusitis, nasotracheal intubation,

epistaxis, gastritis, nasogastric tube syndrome, intracranial entry, gastric perforation, tube knotting, bronchial placement, bronchial perforation, pneumothorax, empyema and sepsis, etc. [1].

Accidental fixation of the nasogastric tube during surgery is a rare complication. Blind removal of a stuck nasogastric tube may be hazardous as it can lead to significant bleeding and gut perforation [2]. To the best of our knowledge, the methods described till date include a diathermy snare, forceps, an endoscopic cutter and a laparoscopic grasper and scissors in the case reports regarding a retained, entrapped or stapled NG tube [2–5]. We quote a novel approach for retrieval of an entrapped nasogastric tube using an endoscopic needle knife sphincterotome.

Technique

Informed Consent The indications, nature and relevant details of the procedure were explained to the patient as well as risks, benefits, alternatives and complications.

Position The patient was placed in the left lateral position

Preparation With a skilled nurse, sedation was provided with intravenous midazolam. Vital signs, including blood pressure, heart rate, and pulse oximetry, were monitored throughout the procedure.

Equipment An upper gastrointestinal side-viewing endoscope, a standard needle knife sphincterotome and an electro-surgical generator were used.

Procedure A bite block was placed to prevent damage to the endoscope and to ease its passage through the mouth. Under direct vision, the side-viewing endoscope was passed through the pharynx, oesophagus and stomach and into the duodenum

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with careful inspection upon both insertion and slow withdrawal. Air was insufflated to distend the lumen to aid in viewing. To our surprise, the nasogastric tube was found entrapped to the anterior wall of the prepyloric region of the stomach with polyglactin sutures. The standard needle knife sphincterotome was introduced in which the diathermy wire is inside a sheath and is exposed by a handle mechanism. With precise movement of the endoscope tip, the elevator was used to move the needle knife to bow against the sutures entrapping the nasogastric tube. An electric current with “pure cut” setting was applied to the diathermy wire and used to cut the knots and retrieve the entrapped nasogastric tube.

Post-procedure Care After the completion of the procedure under conscious sedation, the patient was shifted to the recovery room for further monitoring. He was kept nil per oral and observed for complications, i.e. bleeding and perforation peritonitis.

Case Report

A 45-year-old male patient was brought to our institute with signs and symptoms of perforation peritonitis. A nasogastric tube was inserted preoperatively for decompression of the stomach. He underwent exploratory laparotomy. Omental patch repair with feeding jejunostomy was done for prepyloric ulcer perforation. On postoperative day 7, all attempts to withdraw the nasogastric tube were unsuccessful. Upper gastrointestinal endoscopy evaluation on the 8th postoperative day revealed the nasogastric tube to be inadvertently fixed to the anterior wall of the prepyloric region of the stomach with polyglactin sutures, used to repair prepyloric ulcer perforation (Fig. 1).

Fig. 1 Endoscopic view of entrapped nasogastric tube

Fig. 2 Endoscopic needle knife

Endoscopic cutting of the sutures was avoided at that time as the same sutures were holding the omental patch. The patient was kept on enteral feed via jejunostomy tube for 2 weeks. As polyglactin loses its tensile strength after 2 weeks in tissue, another attempt was made to withdraw the nasogastric tube after 2 weeks but was unsuccessful. Therefore, an endoscopic needle knife sphincterotome using a side-viewing scope was used successfully to cut the knots and release the NG tube (Figs. 2 and 3). Post-procedure, recovery was uneventful. The patient was started orally the same day and was discharged on the 16th postoperative day.

Discussion

Intraoperative nasogastric tube placement provides the benefit of achieving gastric decompression. Accidental fixation of the

Fig. 3 Nasogastric tube—post suture removal

nasogastric tube is a known complication of abdominal surgery, but it is more common with laparoscopic procedures rather than open ones. To prevent unnecessary complication, attention must be paid for proper positioning of the nasogastric tube. Before applying the stitches at the site of the perforation, it is very important to lift up the anterior wall of the stomach or the intestine to make sure that any tube or probe is not coming along with the anterior wall of the stomach or intestine. So it is best to place non-tooth forceps into the perforation very gently so only the anterior wall comes up for stitching while the posterior wall or the tube stays out of the bite [3]. Before tying the knots for the repair of perforation, the nasogastric tube should be rechecked for entrapment.

An endoscopic cutter was used by Sucandy et al. [4] for the retrieval of a retained nasogastric tube following a robotically assisted laparoscopic biliopancreatic diversion with a duodenal switch. A regular front-viewing endoscope was used initially, but due to poor visualization, a side-view endoscopic retrograde cholangiopancreatography (ERCP) scope in collaboration with a gastrointestinal endoscopist was used for adequate triangulation. Hence, the laparoscopic exploration with possible creation of a new anastomosis was avoided. They concluded that the endoscopic approach was a safe, feasible and effective technique to release a retained nasogastric tube with preservation of the newly created anastomosis. Shaaban [2] reported a case wherein the nasogastric tube got stitched to the stomach accidentally during laparoscopic antireflux surgery and a diathermy snare was used to cut the stitch.

Reissman et al. [5] presented a new technique that combined per oral endoscopy with laparoscopic surgical skills for the management of an inadvertently sutured nasogastric tube during fundoplication in a patient with gastrostomy. A 5-mm flexible endoscope was introduced orally alongside the nasogastric tube. The gastrostomy tube was removed, and a fine laparoscopic grasper was introduced through the gastrostomy opening into the stomach to grasp and retract the distal part of the nasogastric tube to visualize the anchoring suture. After the suture was clearly identified, laparoscopic scissors were introduced and the suture was carefully cut.

Preventive strategy includes removing or relocating the nasogastric tube before stitching or stapling and constant

communication with the anaesthetist rather than considering postoperative methods to remove the tube.

In our case, a flexible endoscopic needle knife sphincterotome was used successfully for removal of the nasogastric tube that had been sutured intraoperatively. During gastrointestinal endoscopy, the clinical application of needle knives is greater than any other endoscopic accessory. The flexible endoscopic approach is a small-duration procedure, a minimally invasive, cost-effective technique that avoids the need of redo surgery and unnecessary exposure to anaesthesia.

Conclusion

An endoscopic needle knife sphincterotome is an equally effective alternative to other endoscopic approaches for retrieval of an entrapped nasogastric tube although stress should always be laid on prevention rather than pondering over postoperative measures.

Conflict of Interest Corresponding author: I, Dr Hanish Kataria, declare that I have no conflict of interest. Other authors, Dr Rajeev Sharma, Dr Rajesh Bansiwala, Dr Anurag Jindal and Dr AK Attri, declare that they have no conflict of interest.

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