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A simple technique for the management of refractory gastrostomy site complications a technical innovation in gastrostomy tube site revision

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ABSTRACT

Introduction: Longstanding gastrostomy sites are prone to leakage and excoriation secondary to protrusion of gastric mucosa into the tract, dilation of the site over time, and development of refractory granulation tissue. Surgical revision with creation of a new gastric and skin exit site can be difficult. We describe a technique to re-site a gastrostomy tube (GT) utilizing the existing GT site.

Materials and methods: For one patient with gastrostomy site refractory complications, we re-sited the GT using the existing site. A clamp was placed through the old GT site and was palpated through the abdominal wall. An incision over the tip was made and a silk tie was passed from this new site, exiting through the old site. A One-step™ device was then pulled from the old site out through the new site, and closure of the old gastrostomy was performed.

Results: The procedure took approximately 40 min to complete. Oral and GT intake was started within 3 hours. There were no intra- or post-operative complications. The patient was discharged home the same day.

Conclusion: This simple technique allows for revision of a gastrostomy tube without the use of laparoscopy and permits a cosmetically pleasing incision.

1. Introduction

Gastrostomy site complications are common and can range from minor granulation tissue to extensive skin excoriation [1]. Longstanding gastrostomy tube (GT) sites complications can become painful and nonfunctional, requiring revision. Revision can be complex, necessitating closure of the old gastrostomy, placement of a new gastrostomy in the stomach, closure of the old GT skin site, and selection/creation of a new skin site.

We aim to describe, via an illustrative case, the technical innovation of a simple gastrostomy tube re-siting following a long course with GT site complications.

2. Methods

The new method of GT re-siting was performed in one case of chronic gastrostomy tube site complications requiring revision due to severe local tissue excoriation. A clamp was placed through the old GT site, was palpated through the abdominal wall, and via an incision over the tip,

used to pass a silk tie from this new site, exiting through the old site. A One-step™ device was pulled from the old site out through the new site, and then a straightforward closure of the old gastrostomy performed. A contrast study through the newly positioned button GT study confirmed good positioning and no leak from the previously closed GT site.

3. Case

A 15-year-old male who had a longstanding GT site with chronic leakage and skin excoriation failed conservative management and ultimately required revision and relocation of the GT to a new site. This technique is simple and avoids endoscopy, laparoscopy and the need for a new incision and a more extensive procedure.

A right angle or curved tendon grasper was placed through the old site and pushed up from inside the stomach towards the skin where the new GT site was to be located (Fig. 1B). The skin overlying the tip of the grasper was incised and cautery was used to open the fascia and allow the tip to pop out through the skin. An 0-silk was pulled through the tract by grasping it in the middle to form a double-stranded loop (Fig. 1C). An

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appropriately sized One-step™ button was selected after measuring the abdominal wall thickness (Fig. 2). To do this, we grasped the string tightly and pulled up until the clamp was pressing on the inside of the stomach under the new exit site, then marked the skin level on the string (Fig. 2A). We then pulled back with the clamp and measured from the mark on the string to the clamp. A Malecot or mushroom tip catheter can be used as well (Fig. 2B). The loop of the One-step™ is looped through the silk tie loop, and the catheter/button pulled from the old GT site through the new site. After ensuring good position, the sheath was pulled off (Fig. 2C). The old gastrostomy site was closed with an Endostapler (Fig. 3A) and the skin site was closed using a purse-string technique, resulting in a lateral location of the old site and medial location of the new site (Fig. 3B). Although not performed in this case, a contrast study can be done to verify position if desired.

4. Results

The procedure took approximately 40 min to complete. Oral and GT intake was started within 3 h of completion of the procedure. The patient tolerated feeds. There were no intra- or post-operative complications. The patient was discharged home the same day with immediate use of the GT.

5. Discussion

Gastrostomy tube (GT) placement is a very common procedure performed in children for numerous reasons such as failure to thrive, aspiration risk, feeding difficulties and need for nutritional supplementation (2). Though these are frequently performed procedures, longstanding gastrostomy sites can be prone to leakage and excoriation secondary to protrusion of gastric mucosa into the tract, dilation of the site over time, and development of refractory granulation tissue [1]. Medical treatments (temporary tube removal to allow the site to close, over-inflation of the balloon, etc.) are often employed to attempt salvage of the gastrostomy tube site. Surgical revision can be difficult with closure of the gastrostomy, closure of the gastrostomy skin site, recreation of a new gastrostomy and new skin exit site.

There are several surgical options for gastrostomy tube revision including: percutaneous endoscopic gastrostomy (PEG) tube placement and closure of the old site, laparoscopic closure of the old site and laparoscopic GT placement, gastrocutaneous fistula takedown followed by laparoscopic GT replacement, and open placement of a new button/tube with closure of the old site. Following its development in 1980, PEG tube have become a common option for patients with gastrostomy tube complications, and considered as a favorable alternative to standard open gastrostomy. However, PEG it is not without its complications, especially following prior gastrostomy tube placement [2,3]. A single institution study found that 10.5% of their pediatric patient group receiving PEG tubes developed at least one major complication, with the most common being stomal infection requiring hospitalization [3]. Complications of the PEG technique highlight some of its limitations including the inability to choose an ideal placement site, the risk of abdominal organ or intestinal damage, or the lack of adequate fixation to the abdominal wall [4,5]. In a retrospective review comparing laparoscopic gastrostomy tube to PEG tube placement, PEG tube placement

was associated with significantly more complications, including 3 incidences of transcolonic tube placement, and 4 incidences where re-operation was required due to lack of stomach fixation against the abdominal wall at the time of GT exchange [5]. As a result, laparoscopic GT placement was recommended as the preferred minimally invasive technique for GT placement. Subsequently, two separate systematic reviews also found an increased complication rate with PEG tube placement versus laparoscopic GT placement [6,7].

The use of laparoscopy allows for direct visualization, ensuring that injury to other bowel, such as the colon, does not occur and allows for the surgeon to place the GT in the most anatomically optimal part of the stomach [8]. Laparoscopy also allows for adequate anchoring of the stomach to the abdominal wall, either with a purse string suture [1], or with suspension sutures that go through the entire abdominal wall, the stomach, and then out the fascia and skin on the opposite site of the GT [9]. However, there are still risks to the laparoscopic approach, including being a more invasive procedure and the potential to injure other organs during insertion of the initial laparoscope. For patients that already have a GT in place that require re-siting, the risk of bowel injury on insertion of the laparoscope is higher due to the adhesions that have formed from previous surgeries. With our technique, the risk associated with redo laparoscopic surgery is avoided.

Replacing GTs when an existing site is present presents unique clinical issues that must be considered. The case presented above represents a novel and simple way for creation of a new gastric site without the use of laparoscopy and avoidance of complications associated with the PEG technique. While long-term outcomes are not yet available, we have found that this technique circumvents many of the risks, frustrations, and additional equipment required with other existing techniques.

6. Conclusion

This is the first description of a technical innovation, which utilizes the One-step™ device. Using the existing GT site provides ease of resiting the GT. We recommend this method be considered in patients who have problematic gastrostomy tubes that require resiting.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent: Informed consent was obtained from all individual participants included in the study.

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Declaration of competing interest

The authors have no disclosures or conflicts of interest.



Fig. 1. Original gastrostomy tube site (A). A right angle or curved tendon grasper is placed through the old GT site and pushed up from inside the stomach towards the skin where the new GT site is to be located (B). An 0-silk through the tract by grasping it in the middle to form a double-stranded loop (C).

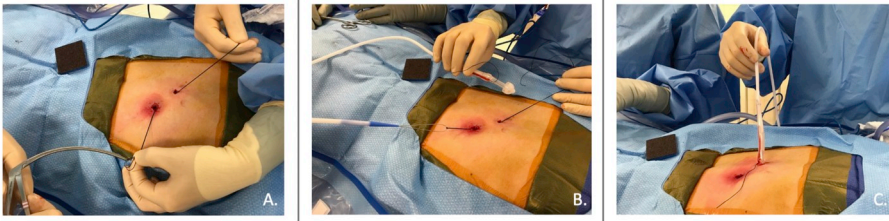


Fig. 2. The One step button is selected after measuring the abdominal wall thickness. To do this, grasp the string tightly and pull up until the clamp is pressing on the inside of the stomach under the new exit site, mark the skin level on the string, pull back with the clamp, and measure from your mark on the string to the clamp. A Malecot or mushroom tip catheter can be used as well. The loop in the One step™ is looped through the silk tie's loop, and the catheter/button pulled from the old GT site through the new site. After ensuring good position, the sheath is pulled off.

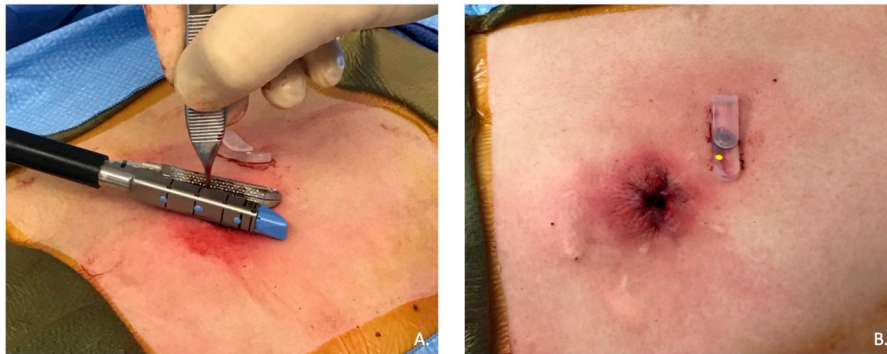


Fig. 3. A standard closure of the old site is performed, an Endostapler to close the tract can be performed (A). The old site is usually closed with a purse-string technique (B).

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.epsc.2019.101335>.

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