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Surgeon-at-work

Transumbilical single-access laparoscopic sleeve gastrectomy plus 1.8-mm trocarless grasping forceps

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Laparoscopic sleeve gastrectomy is gaining popularity throughout the world. Generally, it is performed using 5–7 abdominal trocars but can also be performed through a single-access laparoscopy (SAL) at the umbilicus. This incision is in line with the axis of the stomach, providing access to the stomach without many difficulties. Moreover, the access site can be enlarged to remove the resected stomach from the abdomen with relatively better cosmesis, since the scar is the original umbilical scar.

A past problem working through SAL has been the establishment of the conventional working triangulation needed in laparoscopic surgery. The introduction of curved instruments [1] has helped solve this issue to some measure. Another potential problem is hiatal region exposure and liver retraction, although a preoperative diet for liver shrinkage can offer a hypotrophic liver parenchyma. In the literature, several options for liver retraction have been reported [2–16].

Patient selection remains mandatory, hence the authors recommend that male patients with a body mass index $>40 \text{ kg/m}^2$, with a distance between the xiphoid process and the umbilicus $>20 \text{ cm}$, or who have undergone previous surgery be excluded.

Here, a specific technique of transumbilical SAL sleeve gastrectomy plus 1.8-mm trocarless grasping forceps for liver retraction is described.

Video description

The patient is placed in the supine position, with the legs apart. The surgeon stands between the patient's legs, the camera assistant to the patient's right, and the scrub nurse to the patient's left.

The umbilicus is everted and incised for 2.5 cm. The central fatty tissue is found and enlarged to provide direct access to the peritoneal cavity. A purse-string suture is placed. A reusable 11-mm trocar is inserted inside the purse-string suture and, once the pneumoperitoneum is created, a 10-mm, 30-degree, rigid, normal-length scope (Karl Storz-Endoskope, Tuttlingen, Germany) is introduced as well. Curved, reusable instruments according to DAPRI (Karl Storz - Endoskope) are inserted. A bicurved grasping forceps (Fig. 1A) is inserted without a trocar through a separate fascia window, created by a 6-mm trocar's wire 5 mm outside the purse-string suture at the 10 o'clock position (Fig. 2A). Other instruments, such as the monocurved coagulating hook (Fig. 1B), monocurved scissors (Fig. 1C), monocurved RoBi bipolar scissors (Fig. 1D) and grasping forceps (Fig. 1E), monocurved needle holder (Fig. 1F), straight 5-mm grasping forceps, and suction and irrigation cannula are introduced through a 6-mm flexible trocar 5 mm outside the purse-string suture at the 2 o'clock position (Fig. 2A).

The operation room table is in the reversed Trendelenburg position. The distal curve of the bicurved grasper is used to retract the left liver lobe, but, when necessary, a 1.8-mm trocarless grasping forceps according to DAPRI (Karl Storz - Endoskope) (Fig. 1G), is percutaneously

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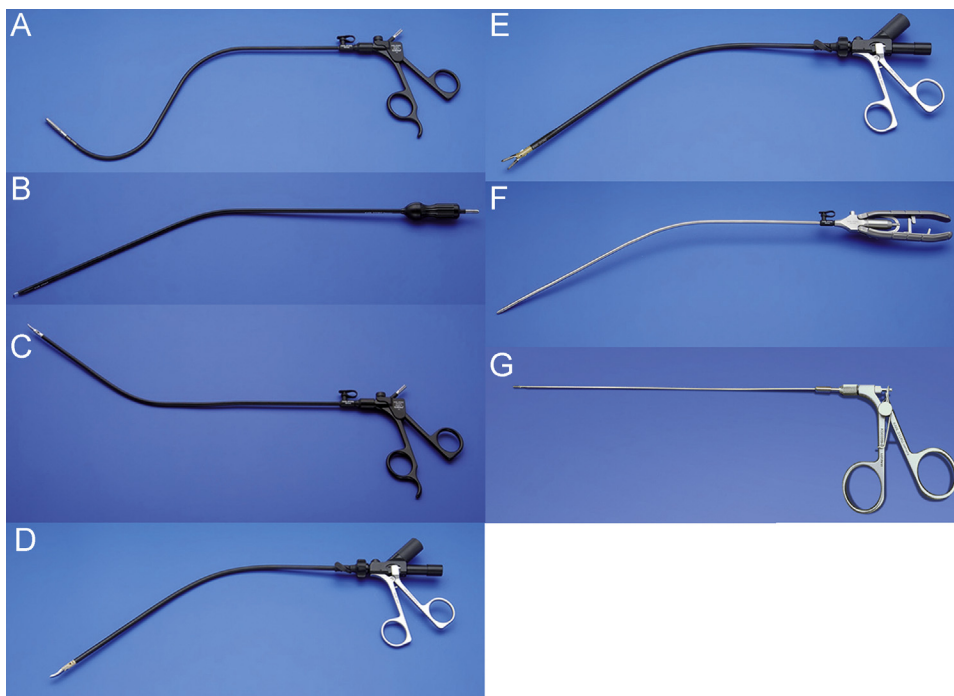


Fig. 1. Reusable instruments according to DAPRI (Karl Storz-Endoskope, Tuttlingen, Germany), (A) bicurved grasping forceps, (B) monocurved coagulating hook, (C) monocurved scissors, (D) monocurved RoBi bipolar scissors, (E) monocurved RoBi bipolar grasping forceps, (F) monocurved needle holder, and (G) 1.8-mm straight trocarless grasping forceps.

inserted through a skin puncture created under the xiphoid, accessed by a Veress needle.

The procedure starts with the identification of the spared antrum and the placement of marks using the monocurved coagulating hook. The lesser sac is open 3–5 cm laterally to these scores, and the greater omentum is dissected from the greater curvature in the direction of the pylorus up to the marks (Fig. 3A).

The reusable 11-mm trocar is replaced by a reusable 13-mm trocar to accommodate a rotator linear stapler, and the 10-mm scope is switched to a 5-mm scope, which is inserted through the 6-mm flexible trocar at the 2 o'clock

position (Fig. 3B). A 36-Fr orogastric bougie is pushed down by the anesthesiologist, and the stapler is fired multiple times. Before the last 2 firings, the degree of the right-sided tilt of the operation room table is increased, and the angle of His is freed from bottom to top to create a retrogastric tunnel using a straight 5-mm grasping forceps (Fig. 4A). The last firings of the linear stapler are performed as well (Fig. 4B).

The 13-mm trocar is replaced by the 11-mm trocar, and the 5-mm scope is exchanged for a 10-mm scope. The resected stomach is freed from the greater omentum using the monocurved coagulating hook or the monocurved

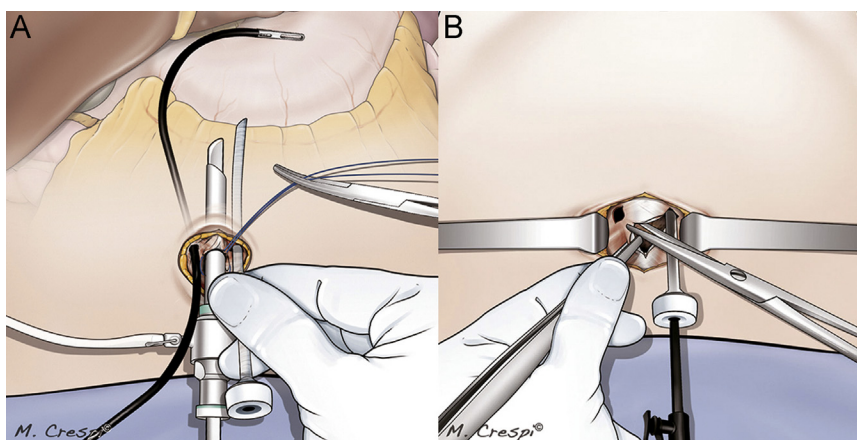


Fig. 2. (A) Placement of the trocars and instruments through the umbilical access. (B) Specimen's removal at the end, joining together the fascia openings.

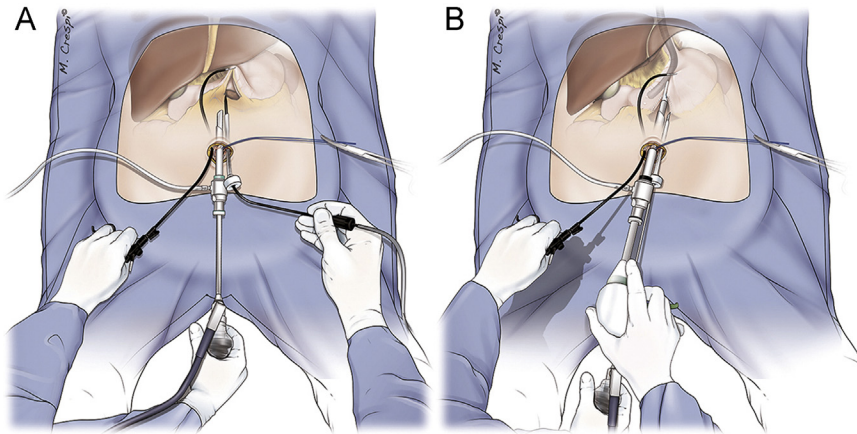


Fig. 3. (A) Lesser sac opening, laterally to the spared antrum, and (B) insertion of the rotator linear stapler under 5-mm scope.

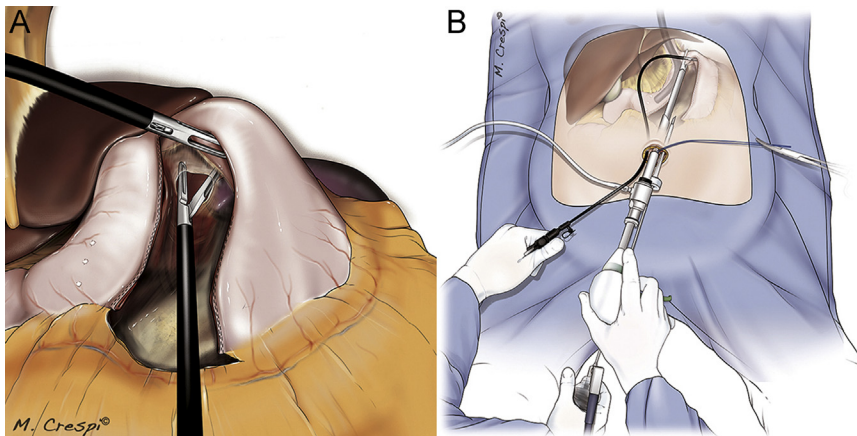


Fig. 4. (A) Mobilization of the angle of His, from bottom to top, and (B) last firing of stapler at the angle of His.

bipolar forceps and scissors (Fig. 5A). The curves in the instruments help reduce instrument clash intracorporeally and between the surgeon's hands externally.

Simple sutures are placed between the firings of the linear stapler or at the bleeding site. The surgeon continues to

work in ergonomic positions, without clashing of the instruments' tips (Fig. 5B).

No drain is left in the abdominal cavity. A nasogastric tube is positioned under laparoscopic view and maintained for 24 hours.

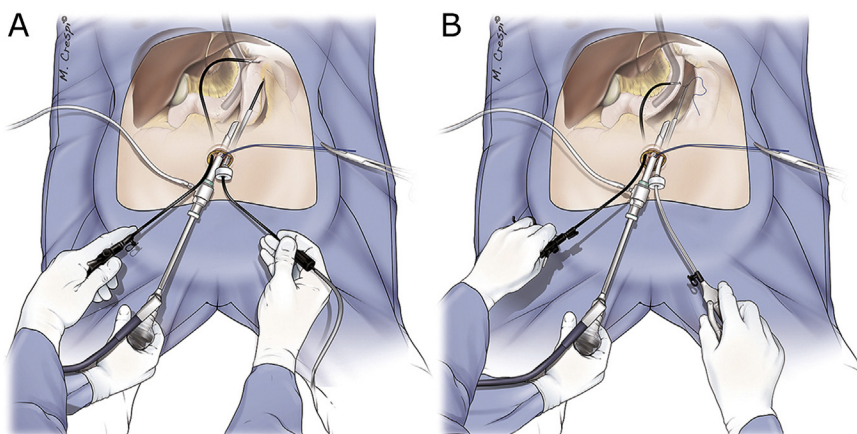


Fig. 5. (A) Mobilization of the resected stomach from the greater curvature, and (B) staple-line suturing reinforcement, with the surgeon in ergonomic positions.

The resected stomach is grasped by a straight 5-mm grasping forceps and removed transumbilically, after having joined together the fascia openings of both trocars at the umbilicus (Fig. 2B). Figure-of-8 sutures are placed to close the umbilical fascia, taking care to close the fascia openings used for the grasper and the 6-mm flexible trocar. The final cutaneous scar measures 2.5 cm.

Conclusions

In this technique, the internal working triangulation is established, along with the surgeon's ergonomics externally, but proper patient selection (body mass index, previous surgery, distance between the umbilicus and the hiatus) is required to ensure feasibility with acceptable operative time and low conversion rate. The insertion of a millimetric trocarless grasper includes liver retraction and also greater omentum traction, when necessary.

Disclosures

The first author is a consultant for Karl Storz-Endoskope, Tuttlingen, Germany. The other authors have no commercial associations that might be a conflict of interest in relation to this article.

Appendix

Supplementary data

Supplementary material cited in this article is available online at <http://dx.doi.org/10.1016/j.soard.2015.03.023>.

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