Single Access Laparoscopic Colectomy (SALC) were reported in several studies. The first Single Access laparoscopic right colectomy was described by Remzi et al. We report our experience in SALC describing our approach for Right Colectomy. In our experience we perform as well an extracorporeal side-to-side anastomosis, in contrast with a conventional laparoscopic right colectomy in which we perform an intra-corporeal anastomosis. We think that an important limit of this approach is represented by the difficult to perform a safe intra-corporeal anastomosis. In conclusion we think that right SALC is a safe and feasible approach. However, many issues will be established, as well as technological, economical and educational aspects, before its introduction in the daily clinical practice.

Key words: single access laparoscopy, high anterior resection, laparoscopic surgery, minimally invasive surgery

INTRODUCTION

Many series have demonstrated the advantages of laparoscopic over open colectomy for the management of benign and malignant disease. With the aim to improve postoperative pain and cosmesis, and also to reduce hospital stay, many surgeons have been introducing in daily practice Single Access Laparoscopic Surgery (SALS).

The first described single-access laparoscopic procedure was an appendectomy for children in 1992 and in 1994 was followed by the first case series in adult.

Several studies were reported in Single Access Laparoscopic Colectomy (SALC). The first Single Access laparoscopic right colectomy was described by Remzi et al. in a 67-year-old female with caecal polyp persisting after two colonoscopies.

Our experience in SALS started in 2009. We use this a single access approach, previously, for Cholecystectomy, Hysterectomy and finally in Colorectal surgery.

HOW WE DO IT

The patient underwent a single access laparoscopic right colectomy using the device "QuadiPort Access System" (Olympus Medical System Corp, Tokyo, Japan; Fig.1). No bowel preparations or diet restriction were used.

A 4-cm vertical umbilical incision was made. Anterior rectus fascia and peritoneum were incised and the umbilicus was suspended with two sutures of Prolene 2/0 stitch. "QuadiPort Access System" (Olympus Medical System Corp, Tokyo, Japan; Fig.1-2) was inserted and the pneumoperitoneum was created. We used A new deflectable laparoscopic optic (Olympus) and straight laparoscopic instruments.

The procedure was performed with patient in supine position and the right arm abducted with the intravenous line. In anti-Trendelenburg position, we started with ileocolic vessels isolation, binding and section. The dissection continued between Gerota’s and Toldt’s fascia using the harmonic scalpel (Ultracision - Ethicon Endo-Surgery Inc, Cincinnati, OH), (Fig.3). The gonadal vessels and the right ureter were identified. Right colic artery and the right branch of the middle colic artery were clipped and sectioned. It was continued by lateral to medial mobilization. The specimen was extracted through the umbilicus and the resection was performed. We performed extracorporeally an iso-peristaltic side-to-side ileo-colic manual anastomosis.

Pneumoperitoneum was re-established to examine the anastomosis and the dissection field for hemostasis. We closed the fascia with interrupted stitches of PDS 1 and the skin with Dermabond glue (Ethicon Inc, Cincinnati, OH).
The naso-gastric tube was removed immediately after surgery whilst the urinary catheter was left in situ to monitor the urine output and removed the following day.

**DISCUSSION**

The first single access laparoscopic right colectomy was described by Remzi et al. The patient was a 67-year-old female with caecal polyp. The operation was completed uneventfully in 115 min with minimal blood loss, by a lateral to medial colonic mobilization including partial hepatic mobilization, extraction and extracorporeal stapled end to side ileocolic anastomosis. Remzi concluded that colorectal SALS could be performed through one incision hidden at the umbilicus. Besides a superior cosmetic result, the potential advantage of less morbidity by minimizing skin incisions may also apply. They suggested that while NOTES is experimental at present, SALS seems to be practical.

After that, many case series were reported with the aim to analyse the hypothetical advantages of right SALS versus Multi Access Laparoscopic Colecotomy (MALC).

Papaconstantinou et al. report a case-matched comparison of a SALS, MALC and Hand Assisted Laparoscopic (HAL) right colectomy cases. Data analysed included operative time, procedure conversion, incision length, length of hospital stay, 30-day hospital readmission, surgical site infection and maximum postoperative pain score. Twenty-nine patients were analysed in each of 3 groups (SALC, MALC, and HAL). Operative time and conversion rates were similar. The incision length for SALC (4.5 cm) and MALC (5.1 cm) groups was similar, and both were significantly shorter than HAL group (7.2 cm). Length of hospital stay was 3.4 days for the SALC group and was more than 1-day shorter than MALC and HAL groups. Maximum pain score on postoperative days 1 and 2 was significantly lower in SALC group.

Authors concluded that single access laparoscopic right colectomy could improve patient recovery through a decrease in early postoperative pain and shorter length of hospital stay when compared with established laparoscopic techniques.

In another recent case-control study comparing SALC right hemicolectomy patients to traditional laparoscopic right hemicolectomy, the inclusion criteria were only ascending colon cecal lesions. A total of 18 patients were included for SALC and the other 21 patients were completed by conventional laparoscopic right hemicolectomy. Initial oncologic results were no different, including equal length of distal cut margin, numbers of harvested lymph nodes, and TNM stage. Three patients in the SALC group were converted (16.6%), and there were no conversions in the traditional laparoscopic colectomy group.

Authors in their preliminary experience with right SALS demonstrated the safety of the procedure and its feasibility in malignant colon cancer. Although right SALS may provide a subjective cosmetic advantage, there was no benefit in the short-term surgical outcomes. They concluded that SALS is very situational, requires more effort from the surgeon, and may not offer more patient comfort.

**FIGURE 1**

**THE PATIENT UNDERWENT A SINGLE ACCESS LAPAROSCOPIC RIGHT COLECTOMY USING THE DEVICE "QUADIPORT ACCESS SYSTEM®"**

**FIGURE 2**

**THE ANTI-TRENDELENBURG POSITION, WE STARTED WITH ILEO-COLIC VESSELS ISOLATION, BINDING AND SECTION**

In both previous case series, in the SALC group the anastomosis was completed as extracorporeal. In our experience we perform as well an extracorporeal side-to-side anastomosis, in contrast with a conventional laparoscopic right colectomy in which we perform an intra-corporeal anastomosis.

Despite a description of totally single access laparoscopic right colectomy with an additional port, we think that an important limit of this approach is represented by the difficult to perform a safe intra-corporeal anastomosis. We believe, as other Authors that an intra-corporeal anastomosis could have better results than extracorporeal one. In comparison to the extracorporeal technique, resection and creation of the anastomosis intra-corporeally could produce superior results with earlier return of bowel function, decreased postoperative narcotic use, and decreased length of stay and morbidity.
In conclusion we think that right SALC is a safe and feasible approach. However, many issues will be established, as well as technological, economical and educational aspects, before its introduction in the daily clinical practice.

**SUMMARY**

"SINGLE ACCESS" LAPAROSKOPSKA DESNA HEMIKOLEKTOMIJA

"Single access" (pristup kroz jedan otvor) laparoskopska kolektomija (SALC) je objavljena u nekoliko studija. Prva "single access" laparoskopska desna hemikolektomija je opisana od strane Remzija i sar. Mi opisujemo sopstvena iskustva i pristup u izvršenju desne hemikolektomije putem SALC-a. U našoj seriji smo takodje izvodili ekstrakorporalnu latero-lateralnu anastomozu, za razliku od konvencionalne laparoskopske desne kolektomije gde se ova anastomozu izvodi intrakorporalno. Naše mišljenje je da je značajno ograničenje ove tehnike teško izvodjenje sigurne intrakorporalne anastomoze. Kao zaključak, možemo reći da je SALC siguran i relativno lak način pristupa. Međutim, postoji mnogo nedoumica i problema tehnološke, ekonomijske i edukativne prirode koji će se pojaviti sa uvodjenjem ove procedure u svakodnevnu kliničku praksu.

Ključne reči: "Single access" laparoskopska kolektomija, prednja gornja resekcija, laparoskopska hirurgija, minimalno invazivna hirurgija

**REFERENCES**

