

The use of single port surgery for polyps located in the rectum

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Transanal endoscopic microsurgery is a minimally invasive technique for the treatment of rectal lesions which was introduced by Buess. In this report the first clinical experience of transanal endoscopic surgery was performed by a single incision laparoscopic surgical port adapted through the anal canal. In single port surgery, the single incision laparoscopic surgical port has to be stitched around anal orifice. There is no need to use a fixation apparatus. In transanal endoscopic microsurgery procedure, a rigid rectoscope 40 mm in diameter is introduced into the anus by stretching anal sphincter. A single incision laparoscopic surgical port can be disposed through the anal canal where there is no harmful cause because it is made an elastic. The dissection in the transanal endoscopic microsurgery procedure needs specific equipment to improve the surgery; however we could complete the surgical dissection using standard laparoscopic devices with articulated ones. The other factor makes single port surgery easier than transanal endoscopic microsurgery procedure is insufflation. It is easy and controlled way to be insufflated by a particular pump and cheaper than any insufflators. Furthermore, in the operating room, the patient's position on the table was not a limiting factor. As a conclusion, we report that for selected patients, single port surgery can be performed using a single incision laparoscopic surgical port as an adjusted surgical technique. It gives safe and feasible way to remove benign and malign polyps and tumors up to 20 cm in the rectum.

Key words: Single port surgery, SILS™ port, transanal endoscopic microsurgery

Tek port laparoskopik cerrahinin rektum poliplerinde kullanılması

Transanal endoskopik mikro cerrahi rektal tümörler için minimal invaziv bir girişimdir. İlk kez Buess (1984) tarafından tanımlandı. Bu vaka sunumunda ilk kez tek port laparoskopik cerrahinin (SILS port) anal kanaldan uygulanarak rektal poliplerin cerrahisi için kullanılması bildirilmiştir. SILS port (Covidien TM) anal kanala uygulanıp peri anal bölgeye sütürlü sabitlendi. Standart ve iki açılı laparoskopik cerrahi aletler yardımı ile rektumda polip rezeksiyonu hem tam kat hem de submukozal olarak yapıldı. Rezeksiyon yeri 2/8 nylon ile kapatıldı. Hastalar komplikasyonsuz 2nci günde taburcu edildi. Patolojik incelemeler sonunda bir hasta da karsinoid, diğerinde ise tübülovillö adenom tespit edildi. Bu ameliyatlar sırasında transanal endoskopik mikro için gereken bir tutucu aparata gerek duyulmadı. SILS elastik yapısı ile 4 cm'lik transanal endoskopik mikro anal probundan daha dar ve daha esnek olduğundan sfinkter mekanizması üzerine de kötü etki oluşturmadi. Transanal endoskopik mikro cerrahisinde kullanılması gereken özel aletlere gerek duyulmadan standart veya iki açılı laparoskopik cihazlar ile prosedür tamamlanabildi. Rektal insüflasyon için kullanılan puar hem kolaylık hemde kontrollü rektal genişleme sağladı. Ameliyat sırasında hasta pozisyonu ise kısıtlayıcı bir faktör olarak belirlenmedi. Sonuç olarak bu makale, rektumda 20 cm'e yukarıya kadar yerleşmiş benign ya da malign poliplerin transanal cerrahisi için tek delikten laparoskopik cerrahinin emniyet ile uygulanabileceğini göstermiştir.

Anahtar kelimeler: Tek delikten laparoskopi, SILS, transanal endoskopik mikrocerrahi

INTRODUCTION

The adenoma-carcinoma sequence has been widely accepted as the cause of cancer of the rectum (1). The first step in the treatment of patients with adenomatous polyps in the rectum is polypectomy, which has been done using either snare coagulation in the presence of suspicion about the stalk of a

polyp or complete local excision depending on the size and morphology. One of the surgical treatments for rectal polyps is transanal endoscopic microsurgery (TEM) (2,3). It is important to know the oncologic accuracy and safety of the procedure particularly in larger or more complex lesions.

TEM is a minimally invasive technique for rectal lesions, and was introduced by Buess et al. in 1984 (4,5). The procedure allows a precise removal of tumors located 6-18 cm from the anal verge (6,7) and has been widely used for the evaluation and treatment of both adenomas and selected carcinomas, with minimal morbidity and mortality (8,9). The technique combines a meticulous dissection and suturing in the ano-rectum up to 18-20 cm from the anal verge under intense endoscopic visualization (10). Morbidity following TEM is reported at rates of 3-10%, including rectal bleeding, suture dehiscence, perforation, and incontinence. Death occurred in 0.5% of patients (2,3). The skill required in performing the procedure and the prolonged learning curve period necessitate an experienced surgeon (11). Furthermore, the procedure is known as expensive for a health care system (12).

In this report, two cases are presented that represent our preliminary clinical experience with transanal surgery using the SILS™ Port (developed by Covidien® for single port surgery) (Figure 1), which was adapted through the anal canal. To our knowledge, this is the first use of the SILS™ Port for a tumor located in the rectum, which could be removed using single port surgery.

CASE REPORTS

The patients were 26- and 67-year-old men with middle-upper rectal sessile polyps not open to endoscopic surgical approach (Figures 2a, b). After the patients declined open or laparoscopic surgery through the abdominal space, their signed informed consents were obtained for the transanal approach, and all of their questions about the procedure and the disease were addressed. The two pa-

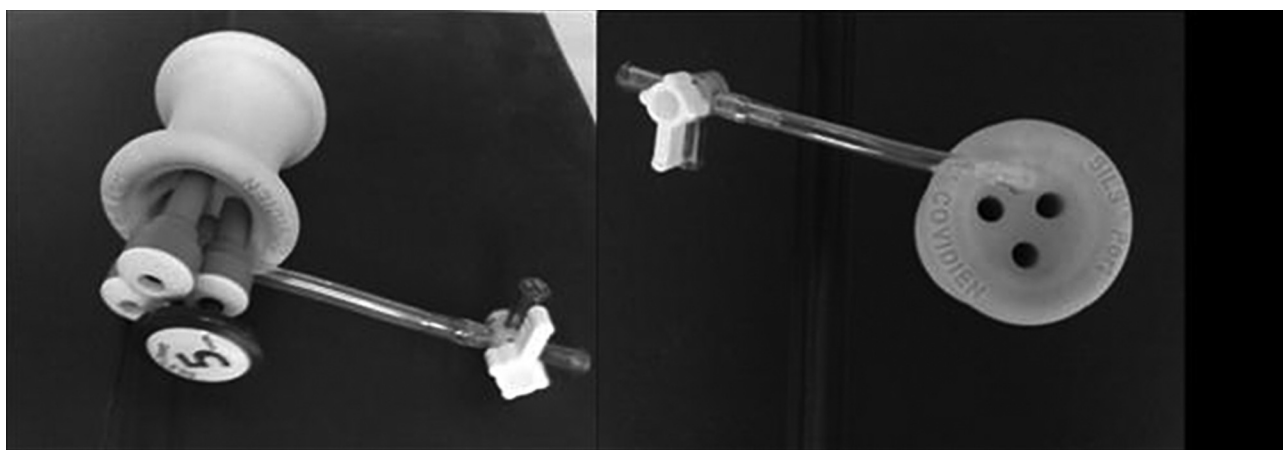


Figure 1. SILSTM Port (developed by Covidien for single port surgery).

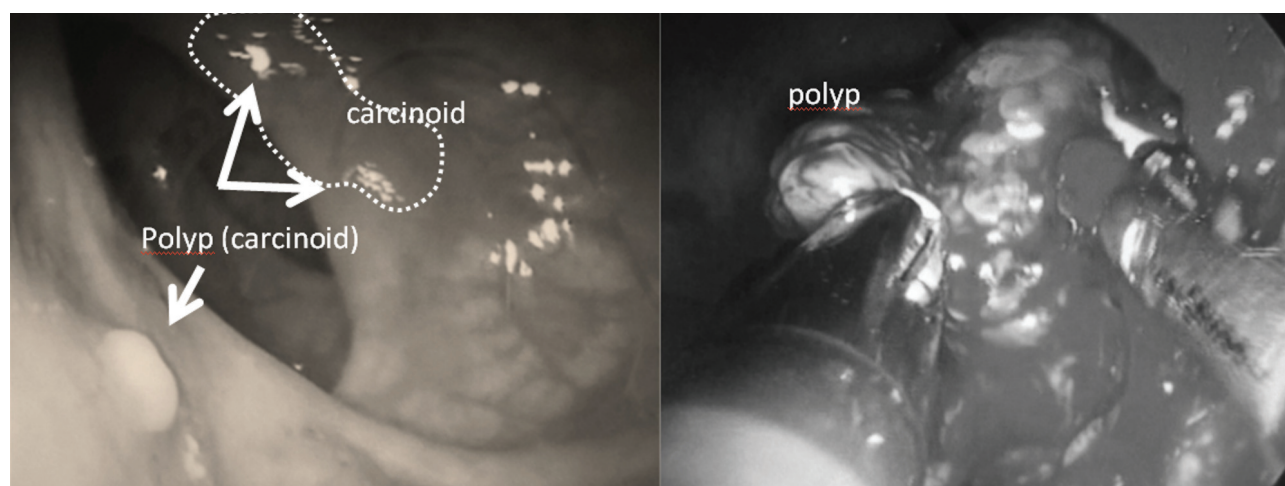


Figure 2. Two lesions located in the rectum in two different patients.

tients were examined in our endoscopy unit. Then, the polyps were biopsied. Endorectal ultrasonography (EUS) built on 270° endoprobe at a frequency of 7.5 MHz and pelvic magnetic resonance imaging (MRI) for accurate preoperative staging were performed. A colonoscopy and abdominal tomography were also performed. Preoperative staging resulted in two different diagnoses: the 26-year-old patient had a carcinoid tumor, while the 67-year-old patient had an adenomatous polyp with moderate degree dysplasia, measuring at least 5 cm in diameter.

The surgical technique by single port surgery was similar to the standard TEM procedure; however, it was carried out through a SILS™ Port placed into the anal canal, which was sutured using four stitches around the anal orifice (Figures 3a, b, c). Bowel preparation was done using two phosphate-soda enemas for each patient about 6-8 hours before the procedure. The patients were operated under spinal anesthesia. They were also given a single perioperative dose of 1st-generation cephalosporin (1 g per dose) and metronidazole (500 mg per dose), and oral-form metronidazole 500 mg was continued twice a day for 5 days. During the operation, complete resection was performed for the carcinoid tumor and a full-thickness rectal wall resection was also performed for the sessile polyp, proven by biopsy as moderate dysplasia (Figure 4a, b). The required standard laparoscopic devices (endoscopic grasper, angulated scissors and bi-angulated grasper-scissors, etc.) were employed via the SILS™ Port into the anal canal. A 5 mm 30° laparoscope was used for good visualization. The rectum was insufflated using the pump for the balloon dissector used in laparoscopic hernia repair (Figure 3). Ultrasonic dissector or monopolar cautery

as an energy device was used to carry out the removal of the rectal tumor completely (Figure 4a, b). The resultant wall opening in the elderly patient was completely sutured using 2/0 Vicryl (polyglactin, Autosuture). In the young patient, the rectal wall defect comprised mucosa and submucosa. It was also sutured completely by 2/0 nylon suture (Figure 5a, b). Operation durations were 112 and 97 minutes, respectively. The final diagnoses of the lesions were revealed as adenomatous polyp with moderate dysplasia and carcinoid tumor. No intraoperative complication was seen except for an air diffusion causing crepitation around the shoulders in the elder patient. A normal low-residue diet was started on postoperative day 1. Hospital stays for the patients were 5 and 2 days in the elderly and young patient, respectively. Although no recognized continence scoring system was utilized, direct prospective questioning did not reveal any permanent or temporary incontinence status.

DISCUSSION

We describe the first single port surgery via the anal canal to remove a rectal tumor located at a high level in the ano-rectum. The procedure was modified from an application of the standard TEM procedure and showed that satisfactory resection could be performed. When local excision is compared with TEM, a TEM procedure is safe, with lower complication rates (9%), and it results in fewer recurrences (4-13%) (13-16). The median conversion to abdominal approach was 5.7% (17). TEM is distinct with respect to some results, as less pain and a shorter hospital stay, which are beneficial for both patients and surgeons. However, the cost is important for each individual undergoing TEM, as it can be as much as two-thirds higher as the cost

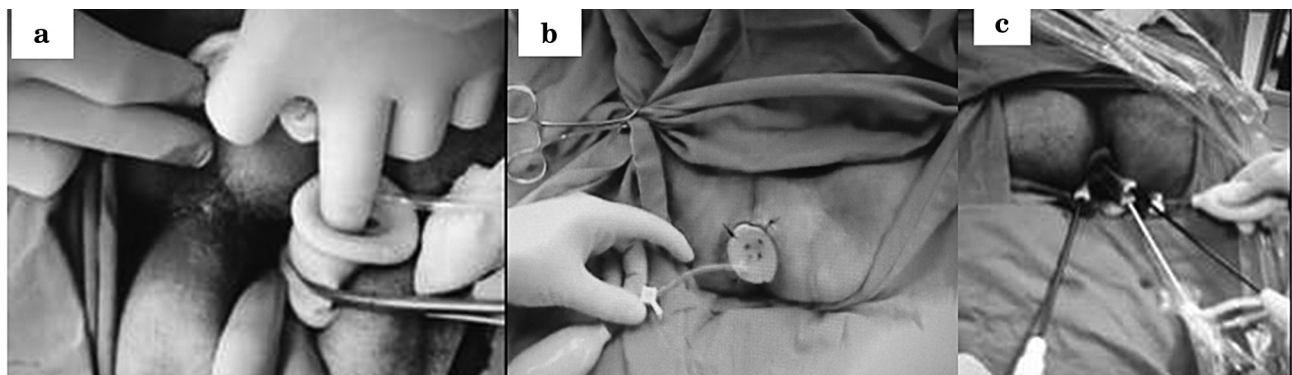


Figure 3. a-b-c. The SILS™ Port was located, stitched around the perineal area and then endoscopic devices and laparoscope was used in the operation.

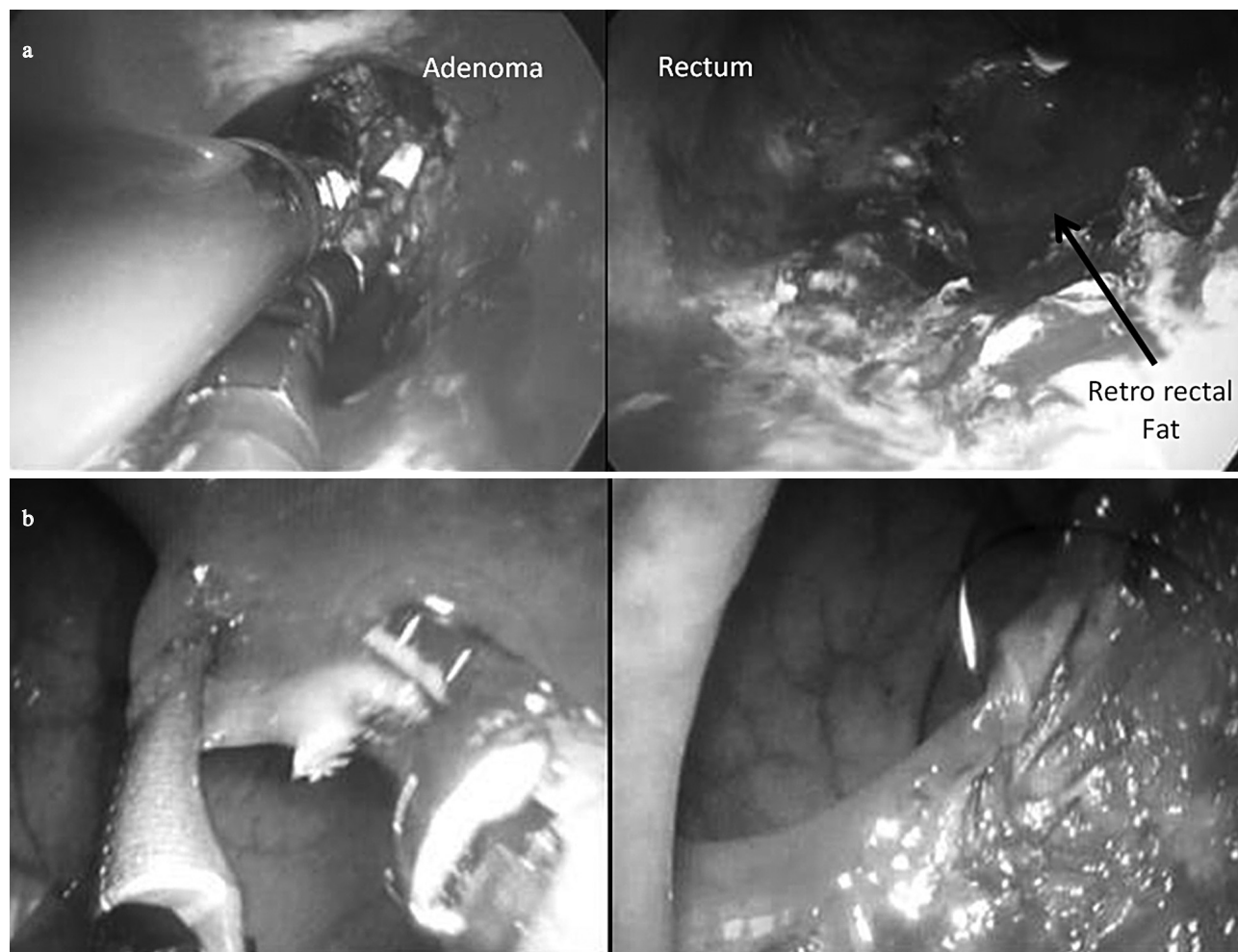


Figure 4. a. Adenoma in the elderly patient was removed with full-thickness rectal wall. b. Polyps in the young patient with carcinoid were removed by resection of the mucosal layer.

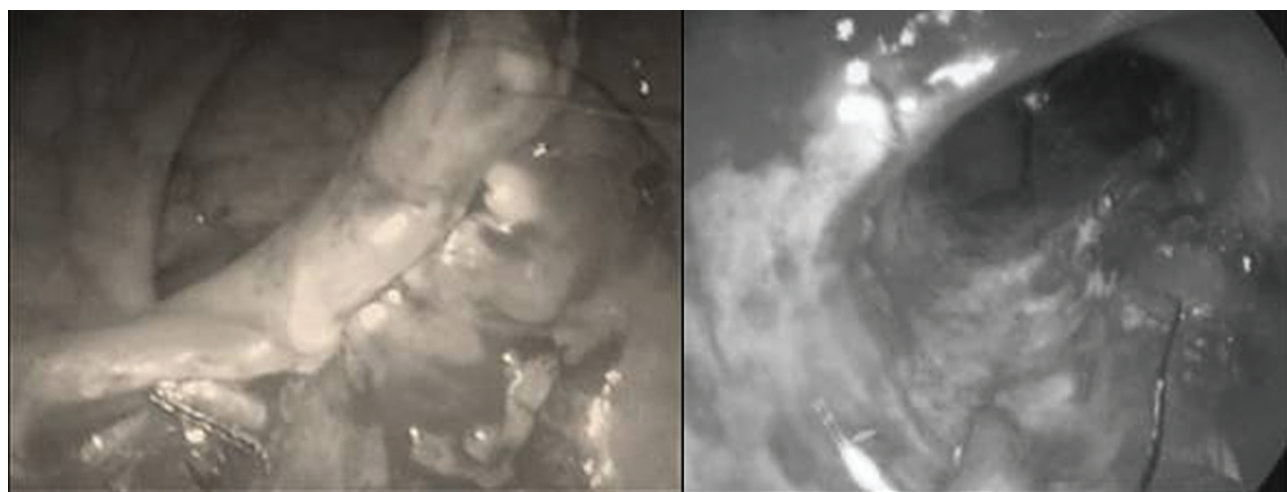


Figure 5. Complete mucosal and full-thickness rectal wall resection was closed using 2/0 nylon suture (Ethicon®).

of the standard procedure. On the other hand, for rectal carcinomas, higher recurrence has been experienced in the patient undergoing TEM than in

those who underwent radical surgery, as reported in some studies with limited series [2,12,18]. Furthermore, TEM can be employed for non-curative

intention as symptom relief (19). The operating time is always longer for a TEM procedure, with the mean exceeding 85 minutes. Preparation for TEM requires a set-up of the surgical system in any operating room, with the appropriate patient position determined according to the tumor localization. The arrangement of teaching and stereo optics with rigid rectoscope assembled by an arm on the operating table is time-consuming (3,5,7,9,17). A single port surgery for these first two cases was performed in a little over 1.5 hours. The time was not spent for preparation of optics or binding lever. However, the SILS™ Port was stitched around the anus, which simplified the procedure. Therefore, SILS™ Port can be used with the patient in any position (Lloyd-Davies or jackknife) on the operating table. Patient positioning was not a limiting factor. We know that in the TEM procedure, a surgeon often uses the lithotomic position, which occasionally makes the surgery difficult and long-lasting (1,2).

Another problem affecting the patient's life quality negatively is a mild incontinence, which can occur after the TEM procedure. Endreseth *et al.* (18) reported that 6% of patients in their study had soiling-moderate anal incontinence that persisted 12 months after the procedure. Considering the other studies, a moderate incontinence after TEM is a rational difficulty, while continence scores have not involved altering a treatment plan (20,21). Nagy (16), in his study, stated that the rate of low profile incontinence after TEM was about 7.5%. In single port surgery, the SILS™ Port placed in the anal canal cannot harm the sphincter mechanism, despite the fact that the operation is long-lasting, because the SILS™ Port is comprised of elastic-type materials; thus, the port is narrowed by contraction of the sphincter muscle. In addition, the radius of the port is smaller (30 mm) than that of the rigid rectoscope (Figure 6). The application of the port into the anal canal is easy using any lubricant.

During the dissection of the rectal lesion via rigid rectoscope in the TEM procedure, specific equipment is often necessary to perform the surgery efficiently; however, we performed the surgical dissection using both standard and articulated laparoscopic devices. The other factor making single port surgery easier than TEM is the insufflation.

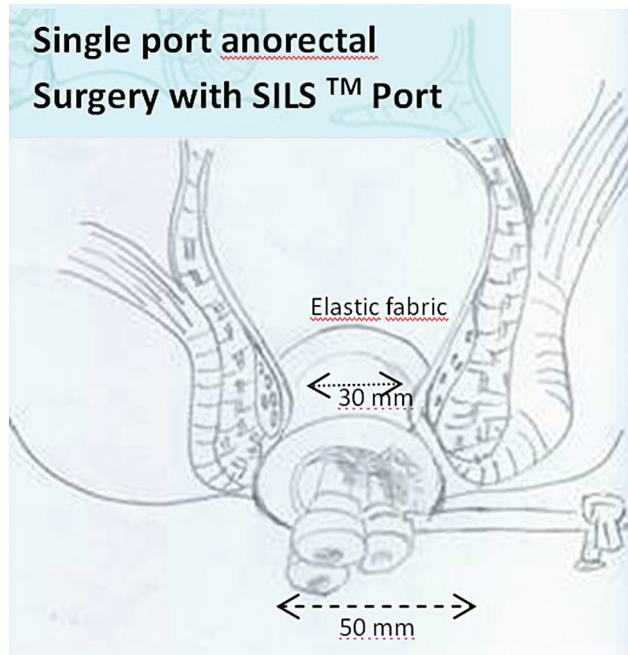


Figure 6. The diagram shows that SILS™ Port was applied simply through the anal canal without risk of incontinence.

In that particular procedure, the rectum was simply insufflated using the pump for the balloon dissector employed in laparoscopic hernia repair. It is an easy and controlled means of inflation and cheaper than any insufflator.

The hospital stay was not shown to be significantly different between TEM (16,19,22) and single port surgery in our cases. The important factor prolonging the hospital stay for the elderly patient was the subcutaneous air that advanced in the retroperitoneal space during surgery.

Transanal endoscopic microsurgery (TEM) is beneficial for the complete removal of rectal polyps with a single-step procedure. In selected patients, we believe that the SILS™ Port as an adjusted surgical technique is a safe and feasible means for removing polyps located in the middle and upper rectum. The technique requires a prolonged learning period and longer operating time compared to local excision. However, it was performed for benign and malignant polyps and tumors up to 18-20 cm in the ano-rectum without tiresome preparation, limitations in patient positioning, use of the rigid rectoscope causing incontinence, or high cost.

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