Overlapping sphincteroplasty for obstetric injury

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ABSTRACT

Obstetric injuries are a common cause of fecal incontinence in women of reproductive age. Maternal and fetal risk factors can increase the incidence. Injuries are categorized into four stages, and repair can be immediate or delayed.
In this report, we present the case of a 27-year-old woman who has been suffering from severe fecal incontinence for eight months due to an obstetric injury that affected both the external and internal anal sphincters. A sphincteroplasty was performed, which involved overlapping the ends of both sphincters separately after carefully dissecting the muscle bundles and preserving the fibrous tissue at the ends of the muscles for reconstruction.
The patient demonstrated favorable progress, significantly improving her incontinence during the short-term follow-up.

Keywords: Sphincteroplasty, Obstetric injury, Overlapping, Fecal incontinence, Anal sphincter

INTRODUCTION

Obstetric anal sphincter injury is one of the main causes of fecal incontinence in women of reproductive age, resulting in significant functional and psychological consequences for patients.[1]
The estimated risk of suffering an obstetric injury is 3%, with a higher incidence observed in nulliparous patients, women over 40 years of age, dystocic deliveries, instrumentation with forceps or vacuum, pushing for more than 60 minutes, episiotomy, and a history of anal sphincter injury.[1]
According to Sultan,[2] anal sphincter injuries are classified into four grades, ranging from severed vaginal mucosa (Grade 1) to complete severed anal and rectal mucosa (Grade 4).
Treatment for a sphincter injury is surgical. If detected during delivery, it can be repaired immediately or up to 12 hours later without detriment to the patient. In immediate repair, overlapping muscle ends or end-to-end anastomosis achieve similar results.[3,4]
When the injury is not detected during delivery, its repair in a second stage can be difficult depending on the degree of alteration of the anatomy and the amount of fibrous tissue present.[5] In this case, performing a sphincteroplasty with overlapping ends has been shown to have good short- and long-term results.[6] We present the case of a patient with a grade 4 anal sphincter injury without immediate repair, who underwent delayed overlapping sphincteroplasty with good functional results.

CASE

A 27-year-old woman with a BMI of 22.5 kg/m² and a history of two deliveries, both involving mid-lateral episiotomies, consulted the coloproctology department due to gas and solid stool incontinence that had persisted since her last delivery eight months earlier. At the first visit, her Cleveland score was 18/20 (she experienced usual solid and liquid stool leakage, constant gas leakage, and continuous use of pads, which profoundly altered her lifestyle).[7] Physical examination revealed the absence of a recto-vaginal septum in the lower third with continuity between the anus and the vagina. (Fig. 1).

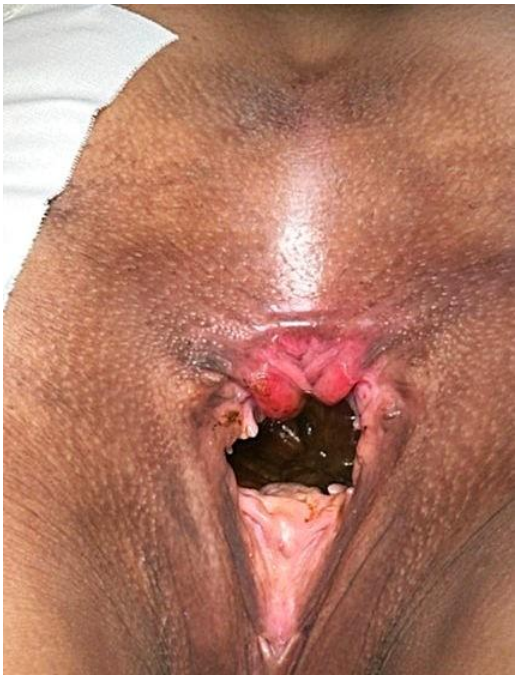

Figure 1. *Preoperative semiology. Absence of the rectovaginal septum in the lower third, with continuity between the anus and vagina, a sequel of an obstetric injury.*

An endorectal ultrasound revealed a lesion involving the internal and external anal sphincters that extended beyond 180°. Anorectal manometry showed severe hypotonia at rest and during voluntary contraction of the anal canal, possibly due to involvement of both sphincters. Based on these findings, an overlapping sphincteroplasty was decided upon.
The patient was required to fast for 12 hours, and a 500-ml saline enema was administered 4 hours before the surgical procedure. Thirty minutes before the incision, 1 g of ceftriaxone and 500 mg of metronidazole were administered.

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The patient was positioned in a jackknife position, with a Kraske roll under the hip. A bladder catheter was placed and

maintained for the initial 24 hours following the surgical intervention. A curvilinear incision was made in the fibrous tissue of the perineal body using a cold scalpel (Fig. 2).

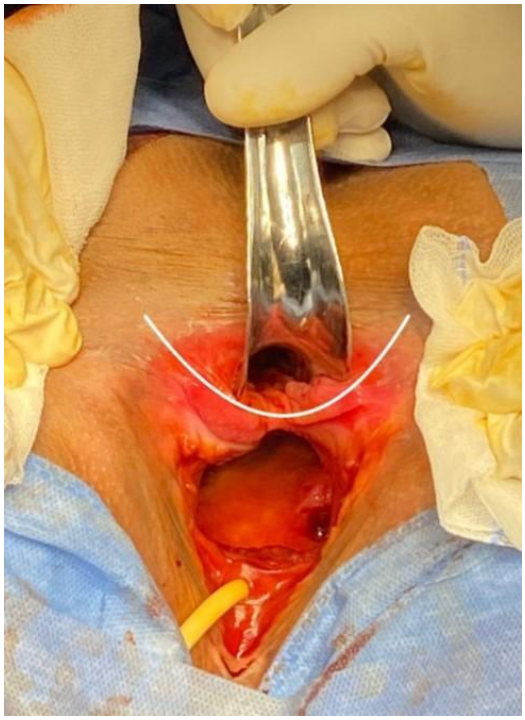

Figure 2. *Surgical repair of the obstetric injury. Curvilinear incision over the fibrous tissue (white line) between the rectum and the vagina.*

The internal and external anal sphincters were identified and dissected separately. The dissection was extended down to the fat of the ischiorectal fossa, a sufficient extent to enable suturing the sphincteric bundles without tension, without reaching too far to avoid neuromuscular injury. The internal and external anal sphincters were identified and dissected separately. The dissection was extended down to the fat of the ischiorectal fossa, a sufficient extent to close the sphincteric bundles without tension, but without reaching too far to avoid neuromuscular injury. A portion of the fibrosis at the muscle ends was retained as firmer tissue to facilitate anchoring the sutures (Fig. 3).

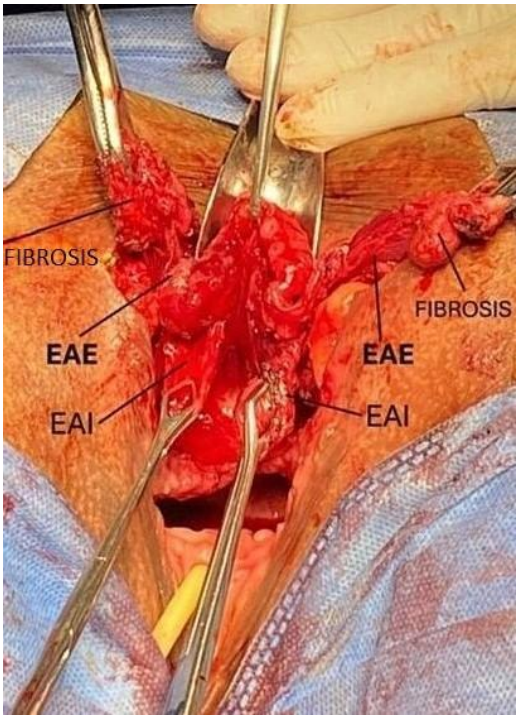

Figure 3. *Following complete dissection, the ends of the internal anal sphincter (IAS) and external anal sphincter (EAS) can be observed, with a portion of the fibrosis preserved.*

The internal anal sphincter was then overlapped with three interrupted 3-0 polyglactin sutures (Fig. 4A). Subsequently, the external anal sphincter ends were overlapped with four 3-0 polydioxanone U-sutures (Fig. 4B). In both cases, the sutures were first repaired and then sequentially knotted, taking into account tension to avoid injury to the muscle bundles. Throughout the procedure, the anoscope was kept in the anal canal, allowing calibration of the orifice after the sphincter anatomy was restored, preventing narrowing of the canal.

Skin closure was performed with 3-0 polyglactin in a Y-shape. Attention was given to avoid skin tightness by placing a rubber laminar drain in the surgical bed. The drain was removed after 24 hours (Fig. 5).

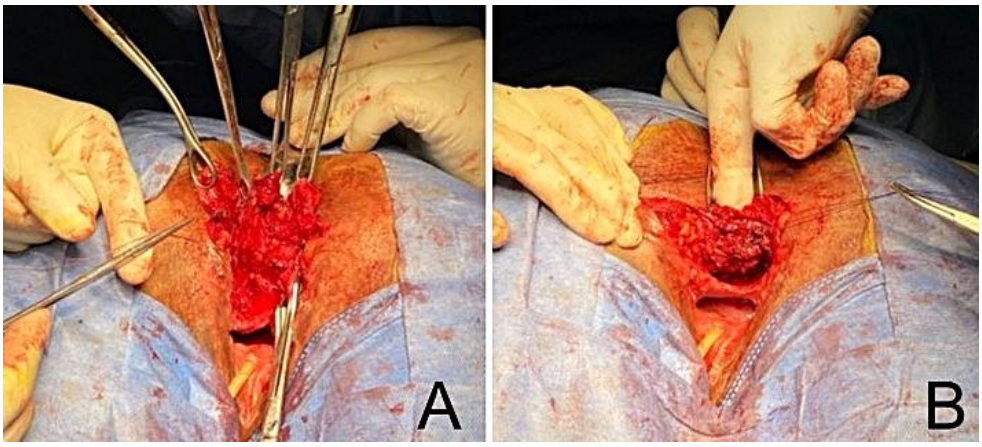

Figure 4. *Suturing both sphincters separately.* ***A.*** *The internal anal sphincter ends are overlapped with interrupted 3-0 polyglactin sutures. The sutures are repaired before knotting.* ***B.*** *The external anal sphincter ends are overlapped with 3-0 polydioxanone U-sutures. Digital calibration is performed before knotting.*

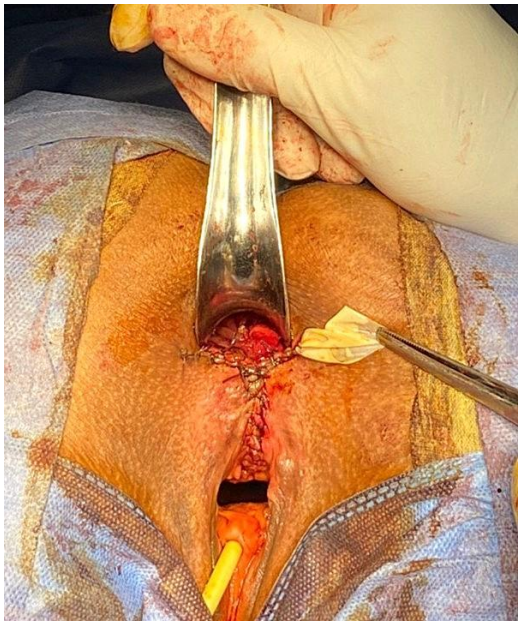

Figure 5. *Vertical closure of the incision to widen the space between the rectum and vagina, leaving a rubber laminar drain.*

The hospital stay was 72 hours, during which the patient received intravenous antibiotic treatment according to the same preoperative regimen. Oral feeding began on the day of the procedure and consisted of a fiber-rich diet. Upon discharge, the patient was instructed to maintain this diet and was prescribed 15 ml of lactulose with lunch and dinner for 14 days (*Lactulon syrup, LAZAR, Munro, Argentina*). Avoidance of vaginal intercourse was suggested for three months, and perineal hygiene guidelines were provided.
The patient evolved favorably with improvement of symptoms in postoperative controls (Fig. 6), presenting at one year after surgery with a Cleveland score[7] of 2/20 (loss of liquid stool and gas less than once a month) and a manometry with mild anal hypotonia and complete circumferential pressure.

DISCUSSION

Two primary techniques are employed to repair obstetric anal sphincter injuries: end-to-end anastomosis and overlapping of the muscle ends (Table 1). [8]
The first proposal of overlapping was documented in 1971 by Parks and McPartlin.[9] They present a series of 20 patients with anal sphincter injuries of various etiologies, including four cases of postpartum injuries for which conventional repair techniques failed. Before sphincter repair, a diverting colostomy was created in all patients except two who refused. The article describes the repair method, which involves overlapping the muscle ends, with preservation of some fibrous tissue and without separation of the internal and external anal sphincter. The authors emphasize preoperative colonic decompression as a requirement for success, showing good results in all cases except those in which the patients refused a colostomy.
In 1991, Wexner et al.10 published a series of 16 women with an isolated traumatic injury to the external anal sphincter. Fifteen of the women had a history of episiotomy, and most had previously undergone attempts at sphincter repair.
The authors described their technique for the dissection and identification of the sphincters separately. The internal anal sphincter was intact and plicated in all cases, followed by superimposition of the external anal sphincter. This preserved some fibrous tissue at the ends of the muscle bundles. Notably, their protocol advocates mechanical bowel preparation as the sole preoperative colon treatment. No patient underwent colostomy before or after surgery. They cited several studies in which surgical success was unrelated to the presence of an ostomy.
In 2021, García-Armengol et al.[11] presented their series of 30 patients with internal and external anal sphincter injuries with defects smaller than 180°, without detailing the etiology. In this study, they modified the technique proposed by Wexner et al.[10] and designated it *"anatomical sphincteroplasty by combined internal and external anal sphincter reconstruction."* This modification emphasized a meticulous dissection of both sphincters separately, even identifying both loops of the puborectalis muscle. Subsequently, a plication of the IAS of a minimum length of 4 centimeters was performed to improve anal canal pressure during rest. Regarding the EAS repair, after removing the fibrous tissue, the ends were overlapped.

Figure 6. *Follow-up two months after repair of the obstetric injury.*

In the present case, the dissection and individualization of both sphincters was performed, preserving a portion of the fibrous tissue at the muscle ends. In contrast to the previously mentioned techniques, given that both the EAI and EAE were sectioned at more than 180°, individual overlapping of each was performed, yielding a satisfactory functional result one year after the repair. Based on the current literature, it was decided not to inform the patient of the potential need for a colostomy before the procedure.[8]
The treating team recommended administering antibiotics for 72 hours after surgery based on personal experience, though this may be limited to the preoperative time.[12,13]

Table 1. Technical comparison of overlapping repair. IAS: Internal anal sphincter. EAS: External anal sphincter.

Author and year of publication	N	Fibrosis	IAS	EAS
Parks & McPartlin 1971 [9]	20	Preserved	En bloc repair with the EAS	En bloc repair with the IAS
Wexner 1991 [10]	16	Preserved	Plication	Overlapping
García - Armengol 2021 [11]	30	Not preserved	Plication or end-to-end suture	Overlapping

CONCLUSION

The anal sphincter overlapping repair technique has been used since its publication more than 50 years ago. Over time, different variants have been published.

The present case involves dissection of both the internal and external anal sphincters, preservation of the fibrous tissue at the muscle ends, and overlapping of both sphincters separately, without the creation of a diverting ostomy. This technique yielded a satisfactory functional outcome in the short term, despite a defect that exceeded 180°.

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