



# Isolated recto-vaginal septum injury during parturition: Single-center experience

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## ABSTRACT

**BACKGROUND:** Traumatic rectal injuries are uncommon and can originate due to various causes. Rectal injuries have a high morbidity, regardless of cause, and detection at the time of occurrence is important to prevent fistula formation and/or stoma. In this article, treatment approaches in patients with isolated rectovaginal septum injury without perineal and sphincter injury during spontaneous vaginal delivery are presented and the current literature is reviewed.

**METHODS:** The records of spontaneous vaginal deliveries that resulted in live births between January 2015 and January 2020 were analyzed retrospectively at our center. The records of patients with isolated rectovaginal septum injury were evaluated in terms of demographic and obstetric data, trauma, classification of injury, and early and late results.

**RESULTS:** Isolated septum injuries were detected 12 women (0.06%). Of the isolated rectovaginal septum injuries, 9 (75%) were classified as Type III, 2 (16.6%) as Type IV, and 1 (8.3%) as a Type V injury according to the Rosenshein classification. Transvaginal repair was performed because all of the injuries underwent early surgical intervention, were limited, and exploration through the vagina was possible.

**CONCLUSION:** Rectal examination should be performed simultaneously with a detailed perineal examination after vaginal delivery. For birth-related rectal injuries detected early in appropriate patients, a primary repair without diversion stoma may be the best option.

**Keywords:** Obstetric injury; rectovaginal septum injury; rectum injury; vaginal delivery.

## INTRODUCTION

Traumatic rectal injuries are uncommon and can originate due to various causes (penetrating or cutting instruments, colonoscopy procedures, rectal contact with blunt objects, birth trauma, or gynecological interventions due to close anatomical proximity). However, the most common cause is low-velocity gunshot injuries.<sup>[1,2]</sup> Knowledge of the clinical course and treatment approaches to traumatic rectal injuries have been based on experience from wars. Increasingly, rectal injuries are now also encountered in civilian life, and although not accompanied by extensive tissue losses, such as in war

injuries, the morbidity and mortality rates are still significant (19% and 11%, respectively).<sup>[3,4]</sup>

Although rectal injuries are not common during spontaneous vaginal delivery, when they occur, they are frequently accompanied by perineal injury, with or without sphincter injuries.<sup>[5]</sup> Isolated rectovaginal septum injuries unaccompanied by perineal with or without sphincter injuries are much less common. They are theoretically classified as extraperitoneal rectal injuries by location, but the treatment approach differs from that of traumatic extraperitoneal rectal injuries. Because this is a very rare injury, there are insufficient data

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about this issue in the literature, and furthermore, no approved treatment approach has been defined.

In this article, patients with isolated rectovaginal septum injuries during spontaneous vaginal delivery are evaluated, the contributing factors for the injury are discussed, and the treatment options are reviewed.

## MATERIALS AND METHODS

Approval for the study was received from the Sakarya University Faculty of Medicine Ethics Committee (No: 71522473/050.01.04/296).

We examined the pregnancy and follow-up records of pregnant women whose labor started and was completed in our hospital. Patients who were followed up in another center, or who were sent to our hospital after labor started for various medical problems and whose delivery took place in our hospital, were excluded.

In the Department of Obstetrics and Gynecology, Faculty of Medicine, Sakarya University, the records of spontaneous vaginal deliveries that resulted in live births between January 2015 and January 2020 were analyzed retrospectively. The labor and delivery records, including the involvement of the general surgery team, were evaluated in detail.

The first perineal examination of the patient was performed immediately after delivery by the obstetrician; any patient with a suspected rectal injury was reexamined by the general surgery team. In the postpartum pelvic evaluation, during the rectal examination, determining a rupture of the posterior vaginal wall, an injury in which the index finger exited from the vagina but was not accompanied by perineum and sphincter injury, was recorded as an isolated rectovaginal septum injury (Figs. 1a and b). Following the primary inspection in the delivery room, detailed examination and surgical repair

were performed under general anesthesia in the operating room. After surgery, patients were followed up by the general surgery team and the gynecology service. In addition to gynecological follow-up after discharge, general surgery outpatient follow-ups were performed once a month for at least 6 months.

In the detailed analyses of the operation records, patients with perineal repair with or without sphincter repair for any reason other than rectal injury were excluded from the study.

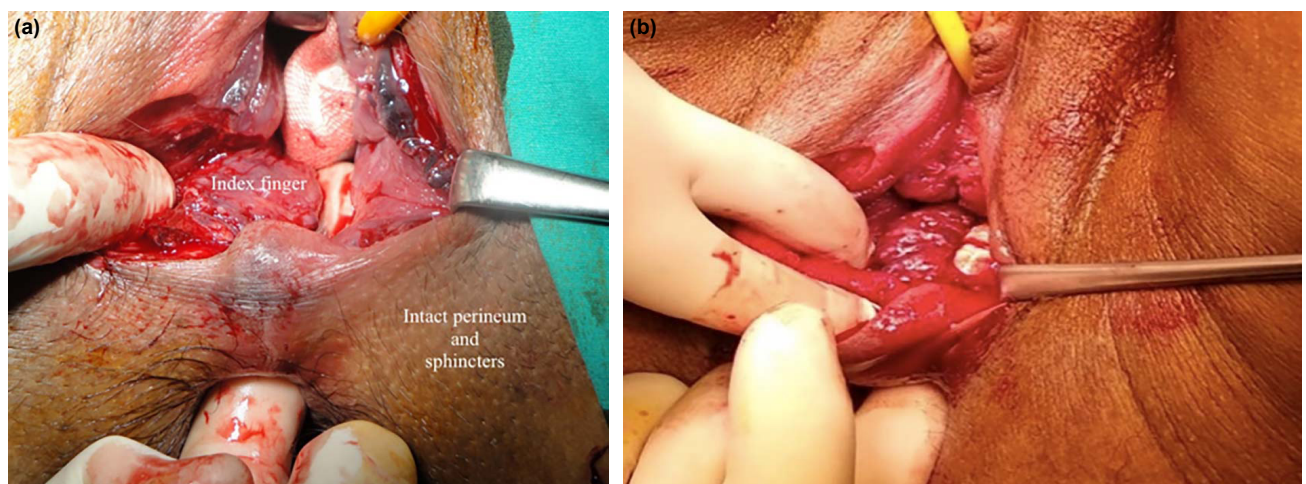
The records of patients with isolated rectovaginal septum injury were evaluated in terms of demographic and obstetric data, trauma, classification of injury, and early and late results.

## RESULTS

During the study period, there were 19,929 vaginal deliveries at our center, and isolated rectovaginal septum injuries were detected in 12 women (0.06%). Antenatal care of all 12 women took place in our hospital. The average age was 22.6 years (21–29), average gestational weeks were 38.2 (37–40w + 3d) according to the last menstrual period, and ultrasonographic measurements were compatible with the gestational weeks. Among these women, 4 (33.3%) were nulliparous, 7 (58.3%) had one previous vaginal delivery, and one (8.3%) had two previous vaginal deliveries.

The deliveries were managed by different obstetricians. In breech presentations (n=9), spontaneous labor was allowed without induction, while medical induction was used with cephalic presentations (n=3) (4 mIU/min oxytocin infusion was initiated intravenously and the dose was increased two-fold in 15 min intervals; maximum dose: 20 mIU/min).

No instrumentation, i.e., vacuum or forceps, was applied during delivery. While a mediolateral episiotomy was performed on all women with a breech presentation, episiotomy



**Figure 1.** (a, b) Rectovaginal septum Type III injury. During rectal examination after vaginal delivery, note that the index finger appears out of the vagina. The perineum and sphincters are intact.

**Table 1.** Classification of rectovaginal septum injuries recommended by Rosenshein

Type 1: No fistula, loss of perineal structure
Type 2: Lower 1/3 vaginal fistula, loss of perineal structure
Type 3: Lower 1/3 vaginal fistula, intact perineum
Type 4: Medium 1/3 vaginal fistula
Type 5: Upper 1/3 vaginal fistula

was not used with any cephalic presentation as these women were all multiparous. Regional anesthesia (pudendal block) was applied to the perineum before episiotomy.

The deliveries were completed without any difficulties for the newborn babies (eight boys, four girls), who were all healthy with a mean 1 min APGAR score of 8–9. The average birth weight of the neonates was 2915.8 g (2320–3965). Because this was a retrospective study, we were not able to obtain any information about the duration of labor.

Of the isolated rectovaginal septum injuries, 9 (75%) were classified as Type III, 2 (16.6%) as Type IV, and 1 (8.3%) as a Type V injury according to the Rosenshein classification (Table 1). In all patients, the perineum was intact, with no sphincter damage. Septal injuries were midline, with a longitudinal course, the length of injury was limited, and tissue loss was minimal. All of the rectal injuries were classified as a non-destructive, Grade II (according to The American Association for the Surgery of Trauma, 1990)<sup>[6]</sup> injury, with an average length of about 3.2 cm (2–5). Surgical intervention was performed in the operating theater within the first 2 h after injury (91.6%) for all except one patient. Transvaginal repair was performed because all of the injuries underwent early surgical intervention, were limited, and exploration through the vagina was possible. First, the rectal wall was repaired with interrupted absorbable sutures, then the posterior vaginal wall, and if an episiotomy had been performed, this was also repaired with the same technique. None of the 11 patients (91.6%) who underwent repair in the early period required a diverting stoma.

In the one patient with a Type V injury, it was identified as a result of stool coming out of the vagina 12 h after delivery. Under general anesthesia, a primary repair was performed as described above, without a diverting stoma. However, on the third postoperative day, stool again came out of the vagina; following drainage and debridement, a primary repair was performed again, together with a laparoscopic diverting loop sigmoidostomy.

In 11 patients (91.6%) who underwent primary repair, oral intake was started on the 3<sup>rd</sup> postoperative day, and after an uneventful course, they were discharged on day 5.<sup>[4–6]</sup> Incontinence or rectovaginal fistula did not occur in these patients,

who were followed up for an average of 11 months (4–36). The patient given a stoma also had an uneventful course thereafter and was discharged on postoperative day 7. In postoperative month 5, the stoma was closed after the previous operation site was checked with rectoscopy and contrast examination. Her 6-month follow-up was uneventful.

## DISCUSSION

Rectal injuries during spontaneous vaginal delivery are one of the significant causes encountered in civilian life. Rectal injuries during vaginal delivery are frequently accompanied by 3<sup>rd</sup>- or 4<sup>th</sup>-degree perineal injuries, and in a study that examined 17,722 vaginal deliveries, this rate was reported to be 8.9% (1572 deliveries).<sup>[5]</sup> Hemorrhage, perineal pain, perineal abscess, dyspareunia, rectovaginal fistula, fecal urgency, and various degrees of incontinence of stool or flatus are among the problems that may be encountered by these patients in the early or long-term postpartum period, and their incidence is not to be underestimated (30–50%).<sup>[7–9]</sup> Although rectovaginal septum injuries are a complication that can occur after pelvic surgery, the isolated rectovaginal septum injury without perineum and sphincter injury after vaginal delivery is very rare, and few patients have been reported in the literature. In the largest case series on this topic (57 patients) in 1980, Rosenshein et al.<sup>[10]</sup> described an anatomical classification of rectovaginal septum defects and reported a rate of delivery-related, isolated rectovaginal septum injury of 22.8%, (13 patients), all of which were Type III injuries. In the literature on the etiology of this injury type, birthweight >4000 g, midline episiotomy, operative (or instrumental) vaginal delivery, fetal position (occiput posterior or breech presentation), loss of regular elasticity of the rectovaginal septum (abnormal septum flexibility due to congenital connective tissue disorders or septum endometriosis), and rapid fetal descent into the pelvis before providing the tissue enough time for elastic adaptation have been proposed to be factors.<sup>[11–14]</sup> None of our cases had a systemic or local disease that would affect the elasticity of the septum; the infants were not overweight, mediolateral episiotomy was performed if needed, and no instrumental intervention was required.

Breech presentation constitutes about 3–4% of all births, and the probability of a more complicated course of delivery is much more likely than with a cephalic presentation.<sup>[15]</sup> Because breech presentations do not have the dense structure of the head presenting, there is not enough pressure on the cervix, and this induces passive and inadequate delivery progression, causing uterine contractions to be moderate and inadequate. Induction is not recommended in breech presentations because it increases the rate of cesarean section and perinatal morbidity.<sup>[16]</sup> Therefore, theoretically, delivery is not expected to be rapid in breech presentations, and therefore, we assumed that a rapid delivery, known to be a risk factor for rectovaginal septum injuries, may only be a determinant in cephalic presentations. In addition, the vagina and perine-

um cannot reach optimal tension and width, because they do not encounter the solid structure of the head at the beginning of the delivery process. Therefore, we estimated that a breech presentation may enable such injuries by eliminating the physical conditions necessary for the rectovaginal septum to reach sufficient flexibility and length. The fact that most of our cases (75%) were breech presentations supports this concept; however, because overall this injury occurred in all breech presentations at a low rate, this may only be a contributing factor rather than the main factor (our total number of breech presentations was >450).

When the history of treating rectal injuries is examined, the development of surgical techniques and the accumulation of knowledge about the treatment process is in parallel with wars. The treatment approaches for rectal injuries from the American Civil War until the end of the Vietnam War evolved from watchful waiting, surgical exploration, exteriorization, diverting stoma, direct repair, presacral drainage, and distal washout. The 3D and 4D (Direct repair, Diverting stoma, Distal washout, and presacral Drainage) approaches have long been the standard treatment.<sup>[17–19]</sup> However, the approach that colon injuries can be repaired without stoma, and the increase in expertise, have led to questioning of the treatment approach in rectal injuries, and in particular, to the view that all Ds should not be applied in all intraperitoneal rectal injuries.<sup>[20–22]</sup> It has finally come to both avoiding diverting stoma in appropriate cases but also withdrawing the routine use of distal washouts and presacral drainage, which increase intra-abdominal complications.<sup>[23]</sup>

The increase in primary repair experience without a diversion stoma for colon and intraperitoneal rectal injuries has raised the feasibility of similar approaches for extraperitoneal rectal injuries and has emphasized that a diversion stoma and presacral drainage are unnecessary if complete repairs can be performed in suitable patients.<sup>[24]</sup> Prospective randomized studies have confirmed that presacral drainage has no impact on infectious complications,<sup>[25]</sup> and more studies on the requirements for a diversion stoma have been conducted. In the guidelines for the approach to extraperitoneal rectal injuries published by the Eastern Association for the Surgery of Trauma in 2016, the phrase “conditionally recommend” was used about creating a diversion stoma.<sup>[26]</sup> Considering the literature to determine which patient group meets the term “conditionally,” (i.e., the appropriate patient group for primary repair without creating a diversion stoma), these patients are described as having a non-destructive (<25% loss of circumference) and Grade II (laceration involved <50% of the circumference) injury. The injury does not reach the perineal region, and there are no findings of peritonitis, no accompanying intra-abdominal organ injury, and no symptoms of shock (hemodynamically stable—systolic blood pressure >90 mmHg). In addition, patients do not require a massive transfusion, do not have a colorectal inflammatory disease, and have no serious comorbidities diseases.<sup>[21,27,28]</sup> All of the

pregnant women who developed rectal injuries in our study were young, healthy individuals of reproductive age without comorbidities. Because deliveries were completed without additional problems other than rectovaginal septum injury, additional obstacles such as bleeding, peritonitis, hemodynamic instability, and perineal injury did not develop. In addition, all of the rectal injuries were classified as non-destructive, Grade II injuries, and therefore they met all of the eligibility criteria for primary repair without an intestinal diversion as listed above.

A technically repairable anatomical injury localization is an essential criterion for primary repair in rectal injuries. Extraperitoneal rectal (particularly the distal 1/3 rectum) injuries are critical in this regard, as they are challenging to access transabdominally. The narrow intrapelvic area, close proximity to the urogenital system, and presence of the sacral venous and hypogastric nerve plexuses make primary repair in this area complicated.<sup>[29]</sup> In injuries with a distal 1/3 rectum localization, transanal repair with the help of anal retractors can also be technically challenging due to the inadequate field of view and lack of space for manipulation of surgical instruments.<sup>[30]</sup> For this reason, various transanal repair methods have been used, including transanal endoscopic operation, transanal endoscopic microsurgery, and endoscopic hemoclips, with reported success.<sup>[31,32]</sup> Using transanal repair methods, limited injuries from surgical procedures such as endoscopic submucosal dissection and rectal injuries after colonoscopic procedures or blunt trauma have successfully been repaired without the need for diversion.<sup>[33–35]</sup> In our study, 91.6% (Rosenshein Type III and IV) of the rectal injuries were in the distal 1/3 rectum and anterior rectal wall, which are technically complicated sites for transanal surgical repair. However, the accompanying vaginal injury facilitated exploration of the rectal injury site transvaginally and surgical repair. In other words, the transvaginal injury allowed the opportunity to investigate and repair the anterior rectal wall injury.

As in all traumas, the elapsed time from the injury to surgical intervention is also important in extraperitoneal rectal injuries. As the time interval duration increases, the surgeon may face septic complications and the possibility of a failed primary repair or resection/anastomosis. Although successful primary repair without diversion stoma has been reported during the first 12 h,<sup>[36]</sup> appropriate operative intervention for primary repair has been recommended in the literature in the first 6–8 h.<sup>[35,37]</sup> Shatnawi et al.<sup>[3]</sup> emphasized that complications were directly related to the presence of septic shock and delay in treatment for more than 6 h, regardless of the type of treatment. In all but one of our patients, we did not perform a diversion stoma, due to early surgical intervention (in the first 2 h). In one late (12<sup>th</sup> h) patient, we performed the same technique without a stoma, but this was not successful, and we later performed an additional diversion procedure.

## Conclusion

Rectal examination should be performed simultaneously with a detailed perineal examination after vaginal delivery. For birth-related rectal injuries detected early in appropriate patients, a primary repair without diversion stoma may be the best option.

**Ethics Committee Approval:** This study was approved by the Sakarya University Faculty of Medicine Ethics Committee (Date: 29.05.2020, Decision No: 71522473/050.01.04/296).

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**Authorship Contributions:** Concept: F.A., E.G., N.F.; Design: F.A., E.G., N.F.; Supervision: F.A., E.G., N.F.; Resource: K.O., H.U.Y., B.M.; Materials: K.O., H.U.Y., B.M.; Data: K.O., M.B.K., E.A.; Analysis: F.A., B.M.; Literature search: F.A., B.M.; Writing: F.A., B.M.; Critical revision: F.A., E.A., N.F.

**Conflict of Interest:** None declared.

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## ORJİNAL ÇALIŞMA - ÖZ

### Doğum sırasındaki izole rekto-vajinal septum yaralanmaları: Tek merkez deneyimi

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**AMAÇ:** Travmatik rektal yaralanmalar nadir görülür ve çeşitli sebeplere bağlı oluşabilir. Nedenine bakılmaksızın yüksek morbiditeye neden olur, fistül ve/veya stomadan kaçınabilmek için zamanında müdahale edilmesi gereklidir. Çalışmamızda güncel literatür bilgisi ışığında perineal ve sfinkter yaralanması olmadan oluşan izole rekto-vajinal septum yaralanmalarına tedavi yaklaşımlarımızı sunmayı amaçladık.

**GEREÇ VE YÖNTEM:** Ocak 2015 ve Ocak 2020 arasında merkezimizde gerçekleşen ve canlı doğumla sonuçlanan spontan vajinal doğum sonuçları geriye dönük olarak analiz edildi. İzole rekto-vajinal yaralanması olan hastaların sonuçları demografik özellikleri, obstetrik bilgileri, travma, yaralanmanın sınıflaması, erken ve geç sonuçlara göre değerlendirildi.

**BULGULAR:** İzole septum yaralanması 12 kadında (%0.06) saptandı. Rosenshein sınıflamasına göre dokuz hastada (%75) tip III, iki hastada (%16.6) tip IV ve bir hastada (%8.3) tip V yaralanma olduğu tespit edildi. Tüm hastalarda vajina eksplorasyonunun izin verdiği ölçüde sınırlı tutularak erken cerrahi müdahale ile transvajinal primer tamir uygulandı.

**TARTIŞMA:** Vajinal doğum sonrası detaylı perineal değerlendirmeyi takiben eş zamanlı rektal muayene de mutlaka yapılmalıdır. Erken dönemde saptanabilen doğum ilişkili rektal yaralanması olan uygun hastalarda stoma uygulanmadan yapılacak primer tamir en iyi seçenek olabilir.

**Anahtar sözcükler:** Obstetrik yaralanma; rekto-vajinal septum yaralanmaları; rektum yaralanması; vajinal doğum.

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