A Novel Use Of Biologic Mesh For Successful Primary Repair of Traumatic Cloaca

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Abstract

Traumatic cloaca is a devastating condition usually secondary to massive obstetric injury with perineal diastasis. Primary repairs are rarely performed and often fail when performed due to hematoma, infection or excessive tissue tension. Methods: We present a case of immediate repair of traumatic cloaca in a 22 year old female with a history of self inflicted traumatic cloaca sustained 8 hours prior to presentation. A detailed examination revealed complete disruption of the perineal body, anterior sphincter complex and rectovaginal septum. Results: The patient underwent a successful immediate layered repair with anterior overlapping sphincteroplasty and biologic mesh reinforcement. Fecal diversion was not performed. She was fully continent at 4 weeks with no functional sequelae. Conclusions: To our knowledge, this is the first reported case of such an unusual mode of injury and its successful primary repair thereof with novel use of a biologic mesh for reinforcement. Primary repair of obstetric trauma resulting in cloacal injuries can be performed using our technique.

KEYWORDS: Traumatic Cloaca, Obstetric injury, Primary repair, Sphincteroplasty, Biologic mesh
**Introduction**

Traumatic cloaca refers to perineal injury that involves disruption of the perineal body, anterior division of the anal sphincter complex and transection of the rectovaginal septum. This leads to a common external opening for both the vagina and rectum, causing fecal and/or urinary incontinence, with devastating functional, sexual, psycho-social consequences.

In majority of patients, traumatic cloaca is associated with obstetric perineal laceration. These cases are uncommon and almost all of the existing literature relates to elective delayed surgical management [1-7]. We present a case of self-inflicted traumatic cloaca managed with successful immediate surgical repair, without fecal diversion

**Case Report And Technical Description**

A 22 year old female was admitted to the emergency room with an 8 hour history of perineal pain and bleeding. Examination of perineum revealed complete disruption of the perineal body and recto-vaginal septum, creating a traumatic cloaca. The patient admitted to self-inflicted trauma involving a pen, but was unwilling to provide additional details of the actual mechanism of injury.

After a detailed informed consent, a single preoperative dose of Ertapenem was administered and general anesthesia was induced. The patient was placed in prone-jack knife position, a urinary catheter was inserted into the bladder, and the perineum, ano-rectum and vagina were prepared with antiseptic solution and draped.

Optimum exposure was achieved using a hook and frame retractor [Lone Star Retractor, Cooper Surgical, Trumbull CT, USA] [Figure 1]. All the layers of the perineum were identified, edges debrided and marked with different colored sutures for ease of recognition during repair. The vaginal mucosa was marked with Vicryl sutures, the rectal mucosa with silk and the sphincter and levator muscles with chromic catgut. Repair of the traumatic cloaca was performed in layers with interrupted absorbable [2-0 Vicryl] sutures. First, the vaginal mucosa was approximated with interrupted sutures, followed by the constrictor vaginae [fibromuscular fascia of the vagina]. The apex of both the vaginal and rectal mucosal lacerations were approximately 8cm from the introitus and were identified and approximated carefully. A perineoplasty was then performed by approximating the puborectalis muscle in the midline again with 2-0 Vicryl sutures. This interposed a layer of muscle between the vagina and rectum and created a new perineal body.
Care was taken not to narrow the introitus. The two edges of the external anal sphincter were then exposed and sutured together in an overlapping (vest over pants) method using 2-0 prolene sutures taking care not to narrow the anal orifice, and to permit an index finger to be inserted with ease. A biological mesh [Alloderm, Life Cell Corporation, Bridgewater, NJ, USA] measuring 3cm by 3cm was then placed within the recto-vaginal space just deep to the approximated vaginal mucosa to provide added support. The sero-muscular and mucosal layers of the rectum were closed and a penrose drain was placed in the recto-vaginal space.

The wound edges were then irrigated with saline solution and the skin was loosely closed with interrupted absorbable sutures (Figure 2). A diverting colostomy was not performed.

The patient was ambulated the next day and allowed to walk around or lie in bed but was not allowed to sit for one week. The dressings were changed daily, the catheter removed on day 4 and the patient discharged. The penrose drain was removed at the one week follow-up appointment. The wound healed completely without infection or disruption. She was fully continent to urine and feces on assessment at 4 weeks [Figure 3].

**Discussion**

Traumatic cloaca is characterized by a deep laceration which disrupts the perineal body, sphincter complex and rectovaginal septum. The result is an open communication between vaginal and rectum [1]. They are usually secondary to obstetric injuries, and failure of primary repair at childbirth. The incidence of traumatic cloaca is approximately 0.003% of all vaginal deliveries, and is more common with the first delivery, with presence of median episiotomies, forceps delivery and large birthweight infants [4, 6].

Various techniques for repair, with acceptable results, have been described in literature. These include X flaps [5], modified lotus petal flap [2], gracilis flaps and layered anatomic closure [6]. The perineum has an abundant arterial anastomotic network and lends itself very well to a variety of local flaps. Kaiser [5] described a detailed procedure for delayed repair of neglected obstetric cloacal injuries which is similar to our technique with the addition of perineal full thickness advancement flaps to augment the perineum and reconstruct the perineal body. He reported a 75% success rate with this procedure. The use of a modified Lotus petal flap was described by Altomare for delayed repair of traumatic cloaca due to vaginal delivery with excellent results [2]. The addition of flaps however increases the complexity of the procedure and has its own set of complications, besides mandating fecal diversion.
Most obstetric injuries have no tissue loss – rather there is displacement of muscle and skin laterally. The perineum can therefore be restored adequately by anorectal, vaginal, sphincter and anovulval perineal skin repair, without recourse to a flap [3]. Some form of sphincteroplasty has to be incorporated with the above procedures. There is no definite evidence for a diverting stoma. The experience and thought process for repair of such injuries by use of native tissues derives from the experience with episiproctotomy or perineoproctotomy for repair of large rectovaginal fistulae and obstetric injury associated cloaca. In a series of 42 patients with a mean follow up of 37 months, Hull et al reported the use of episiproctotomy with careful separation of tissue layers, identification and approximation of the anorectal mucosa, overlapping sphincteroplasty and vaginal mucosal approximation with good results [8]. None of their patients with cloacal deformities had a recurrence. However 11 patients with some amount of anterior tissue had a recurrence of whom 8 had previous repairs. Perhaps the use of a biologic mesh in this group may reduce the recurrence rate.

It is thought appropriate to delay repair for three months from the time of injury for the inflammation to subside and for clear definition of tissues layers [9]. We have challenged established practice and shown that primary layered repair with the novel use of a biologic mesh for reinforcement can result in an excellent outcome functionally and cosmetically.

**Conclusion:**
We described a unique case of self inflicted traumatic cloaca primarily repaired with use of a biologic mesh. Immediate repair is technically demanding, as recognition of tissue layers can be difficult, if not impossible. Use of different coloured sutures can aid with proper layered repair. This is a complex reconstruction and repair which is best performed by a specialist in Colon and Rectal Surgery with extensive experience in anorectal and pelvic floor surgery. The use of a biologic mesh to create a neo rectovaginal septum decreases the chances of communication of the vaginal and anorectal suture lines and stimulates fibrosis to form a strong layer. Contrary to established dogma, there is no need for fecal diversion unless there is contamination of tissues or a very complex repair with use of flaps is performed.

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References:
Figure 1 Traumatic cloaca- lone star retractor exposure and suture labeled layers
Figure 2. At the completion of the repair
**Figure 3.** Four weeks postoperative picture