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Caesarean section: a case report of critical attempt to abdominal wall

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ABSTRACT

Introduction. Caesarean section (CS) represents the most widespread and performed procedure in obstetrics. It is an undisputed guaranty in life-threatening conditions, as a primary choice to decrease mortality and morbidity of women and new-borns.

Case report. We describe an exceptional case of a pregnant woman, previously undergone to several surgical procedures because of a unique and complex abdominal and genito-urinary congenital abnormality, with an extended prosthetic abdominoplasty. In 2018 the patient experienced a spontaneous pregnancy, whose course was strictly controlled in our center by a specialized multidisciplinary team. Pregnancy, despite multiple problems, hesitated in an only slightly preterm birth, since the CS was planned at 36 weeks of gestation, in order to avoid possible complications both for the mother and the baby over the last weeks. The CS was mandatory because of the complex congenital abnormality of the patient. It was performed by a lateral paramedian abdominal incision, in order to avoid any transection of the abdominal mesh. Both the post-operative period and the follow-up were uneventful. Newborn was in good condition and completely breastfeed.

Conclusions. The individualized technique used for CS demonstrate the importance to adapt the surgical technique even in a procedure whose approach is standardized all over the world.

SOMMARIO

Introduzione. Il taglio cesareo (CS) rappresenta la procedura più diffusa ed eseguita in ostetricia. È una garanzia indiscussa in condizioni di pericolo di vita, come scelta primaria per diminuire la mortalità e la morbilità delle donne e dei neonati.

Caso clinico. Descriviamo un caso eccezionale di donna incinta, precedentemente sottoposta a diversi interventi chirurgici a causa di un'anomalia congenita addominale e genito-urinary unica e complessa, con addominoplastica protesica estesa. Nel 2018 la paziente ha avuto una gravidanza spontanea, il cui decorso è stato rigorosamente controllato nel nostro centro da un team multidisciplinare specializzato. La gravidanza, nonostante i molteplici problemi, ha esitato in un parto solo leggermente pretermine, poiché il CS è stato programmato a 36 settimane di gestazione, al fine di evitare possibili complicazioni sia per la madre sia per il bambino nelle ultime settimane. Il CS era obbligatorio a causa della complessa anomalia congenita della paziente. È stata eseguita con un'incisione addominale paramediana laterale, al fine di evitare qualsiasi recisione della maglia addominale. Sia il periodo post-operatorio sia il follow-up sono stati tranquilli. Il neonato era in buone condizioni e completamente allattato.

Conclusioni. La tecnica individualizzata utilizzata per CS dimostra l'importanza di adattare la tecnica chirurgica anche in una procedura il cui approccio è standardizzato in tutto il mondo.

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Key words

Caesarean section; paramedian incision; genito-urinary malformation; transitional care; multidisciplinary team.

INTRODUCTION

Caesarean section (CS) is one of the most commonly performed abdominal procedures in women. Although it was introduced in clinical practice as a life-saving procedure both for mothers and babies, nowadays there is an alarming globally increase in CS rates, related to the augmentation of unnecessary procedures (1).

CS is associated with short and long-term maternal morbidity, including consequences for future pregnancies, such as an increased risk of spontaneous preterm birth, uterine rupture, and abnormal placentation, that may result in maternal bleeding and hysterectomy (2). Moreover, newborn may suffer respiratory problems, with long-term increase in autoimmune and obesity related problems (3).

On the other hand, CS represents a fundamental option in selected cases, in order to reduce risk events for both the mother and the newborn (1).

Nowadays there is a widespread use of standardized CS surgical technique (4, 5). However, the obstetric surgical skills have to be adapted to challenging conditions. Therefore, the expertise in surgical options could act as a major ally when the optimal choice is necessarily directed towards alternative techniques. In our case, CS was mandatory in order to preserve the mother and the newborn wellbeing. It was carefully planned by a multidisciplinary team because of the complexity and unicity of the case and her hostile abdomen. Moreover, the site of the CS was judiciously chosen by the same team, thanks to the preoperative scans of the patient.

CASE REPORT

The patient was born with a gastroschisis and a complex malformation of the urogenital tract (double bladder, vaginal and urethral septation, unique vestibular ostium, pubic diastase, abdominal wall defect). At birth she underwent surgery to treat the gastroschisis. At the age of 7, a complex surgery was accomplished: bilateral posterior iliac osteotomy, vaginoplasty, unification of the two bladders, urethroplasty with anterior bladder flap according to Tanagho technique, clitoridoplasty, umbilicoplasty, and anterior wall plastic were realized. At the age of 9, a new procedure was performed because of a complete urinary incontinence: closure of bladder neck, end-to-side transurethral-ureterostomy of the right ureter on the left, pro-urethra

appendix (orthotopic Mitrofanoff), distal vascular right ureteral stump (orthotopic), and positioning of abdominal monofilament polypropylene mesh (Marlex mesh; Bard Davol Inc, Warwick, RI) to strength the abdominal wall defect were realized. However, urinary continence was achieved thanks to clean intermittent catheterization and oxybutynin per oral. Nevertheless, the patient suffered recurrent lower urinary tract infections (UTIs) and bladder stones. Over the following years, the patient underwent several lithotripsies through cystoscopy. At 28 years of age, a surgical procedure was performed to treat bladder stones: through laparotomy and cystotomy, bladder stones were removed. However, in order to access the hostile abdomen, it was necessary to remove the mesh and several adhesions. A bowel resection was necessary due to a double intestinal perforation, and an end-to-end jejunal-ileal anastomosis was performed. On the left side, persistent complex adhesions between the sigmoid intestine and abdominal wall were left in place, in order to avoid further bowel resections. A new abdominal mesh was positioned (non-cross-linked porcine dermal scaffold, XenMatrix™; Bard Davol Inc, Warwick, RI). A 15 by 10 cm mesh was placed. It was located in the central and lower abdominal quadrants, in order to fill the gap given by the abdominal wall defect of the patient. Finally, an abdominoplasty under severe tension was accomplished. A vacuum-assisted closure (VAC) therapy was required during the healing of the wound.

At the age of 30 the patient had a spontaneous pregnancy and was referred to the high-risk pregnancy clinic of our Obstetrics and Gynaecology Department. Pregnancy was at high risk of UTIs (as the patient has suffered several UTIs), preterm birth, and intra-uterine growth restriction (IUGR), because of the complex malformation of the urogenital tract of the mother as well as the strong and copious endo-abdominal adhesions, the merely absence of the muscles of the abdominal wall, and the presence of an abdominal mesh. The pregnancy implanted normally in the right uterine wall, with a normal first trimester course. The Down screening at 12 weeks of gestation showed nuchal translucency NT 2.6 mm, with a risk of 1/4,662 and a cervical biometry at the lower limits (26 mm). During the second trimester, the abdominal ultrasound vision got obscured by the mesh. Therefore, the scan was carried out transvaginally and through a 3D reconstruction of the section planes. No major fetal abnormalities were identified; the

cervical length remained stable (cervical biometry 25mm at 20 weeks of gestation). Moreover, a normal placental implantation in the right-side wall, and a regular uterine dopplers were detected.

At 22 weeks of gestation, the patient suffered a febrile UTI with a suspected sepsis. She was then admitted as inpatient in order to receive an intravenous antibiotic treatment.

Throughout the third trimester, an apparent normality of fetal anatomy was confirmed by ultrasound (US)-scan, but IUGR was detected (abdominal circumference < 5th centile, with a stable uterine dopplers detected). Biometry and Doppler follow-up were therefore set.

The patient experienced a further hospitalization at 32 weeks of gestation, because of threatened preterm labor with increasing inflammation markers. A single tocolytic course and betamethasone were performed for lung maturation therapy with antibiotics. Given the increasing IUGR, the need for an elective planned CS, and in order to avoid possible complications both for the mother and the baby over the last weeks, the timing of birth was set by a specialized multidisciplinary team (*i.e.*, Head of Obstetrics and Gynecology Unit, Head of Neonatal Intensive Care Unit, Head of Anesthesiology Unit, and Head of Pediatric Surgery Unit) after the completing of 36 weeks of gestation. The multidisciplinary team excluded a vaginal delivery because of the issues related to the complex urogenital malformations of the patient (*i.e.*, a very fragile and irregular urethra, with problematic urinary continence and a mandatory clean intermittent catheterization, the absence a real abdominal wall, and the presence of the abdominal mesh). Therefore, the team did prefer not to stress or further compromise the fragile urogenital and abdominal anatomy of the patient. The timing of birth set after the completing of 36 weeks of gestation was accurately set by the same team. For instance, Neonatologists required as much lung maturation as possible. On the other hand, the team carefully evaluated both the increasing IUGR and the possible risks either for the mother and the baby given by the increasing weight and height of the fetus during the last weeks of gestation.

The surgical approach was individualized on the basis of multiple goals: 1) to avoid abdominal access extension into the left abdomen, where extensive adhesions were located, 2) to avoid mesh transection, 3) to obtain a safe and rapid access to the pregnancy site, in order to prevent difficult fetal extraction. The best abdominal access appeared to

be the right lateral paramedian access. The CS was performed under spinal anesthesia. Through accurate preoperative US-scan, the right lateral margin of the mesh and the presumed anterior edge of the placental implant were identified and marked on the operative field for surgical incision (**figure 1**). A CS with right paramedian access (**figure 2**) was performed. It took close to 20 minutes to achieve the uterus for the hysterotomy. A high uterine incision (**figure 3**) avoiding mesh transection and placental insertion (**figure 4**). A breech extraction of the cephalic fetus was easily performed (**figure 5**). Oxytocin with ergometrine maleate were used for the third stage, with normal blood loss. Uterus was sutured in two layers. The length of all surgical procedure was close to 120 minutes. The male newborn weighted 2,280 grams, Apgar score was 6 and 9 at the 1st and the 5th minute, amniotic fluid was meconium stained. The newborn needed to be aspirated and ventilated and he was hospitalized

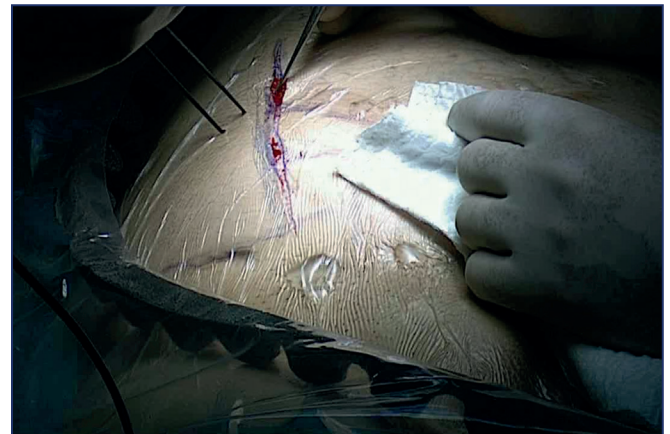


Figure 1. Right lateral paramedian incision. Following a preoperative US-scan, this incision was established in order to avoid mesh transection.

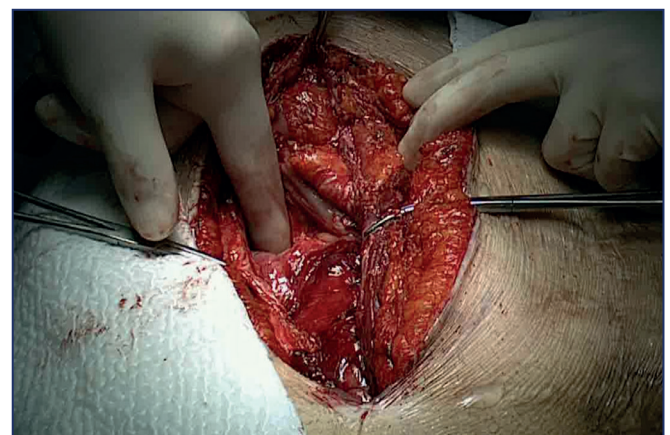


Figure 2. Right lateral paramedian access to the uterus, with a longitudinal incision near the lateral border of the rectus sheath.

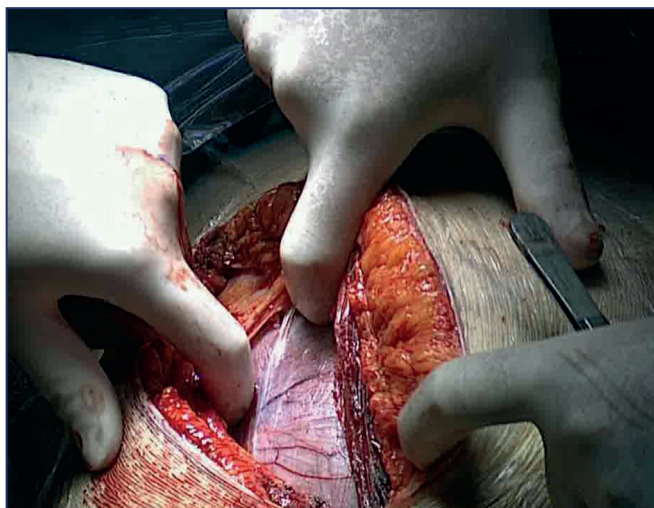


Figure 3. Site of uterine incision. A high uterine incision was performed, as per preoperative US-scan.

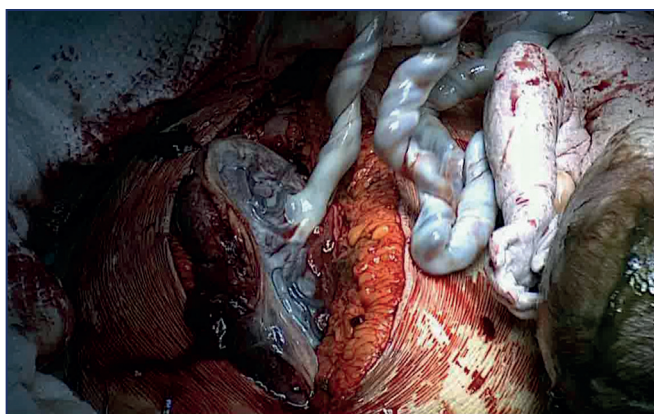


Figure 4. Placental insertion. Thanks to the high uterine incision, placental insertion was avoided.

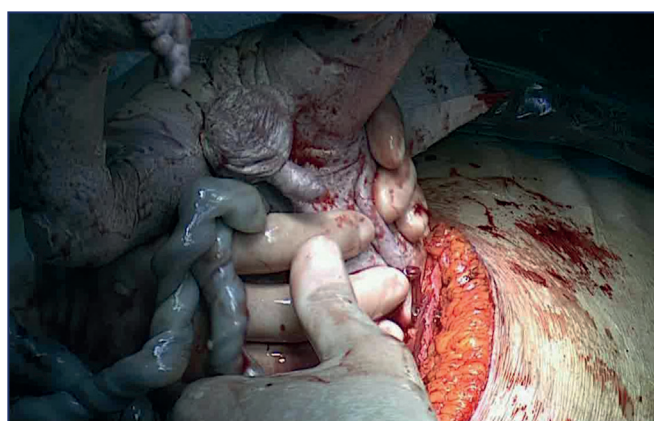


Figure 5. Breech extraction of the cephalic fetus.

for 3 days. Post-operative period was uneventful. Antibiotic and thromboembolic prophylaxis were performed for 7 days. Oxybutynin was stopped during breast-feeding. At 2-years follow-up, the patient and the child were in good health conditions.

DISCUSSION

During last decades, advances in reconstructive surgery have improved both the health and the quality of life in women with complex genito-urinary tract abnormalities, thus reaching reproductive age and considering pregnancy. However, literature suggests impaired fertility and higher risk with pregnancy (6). The case report we have presented was affected by multiple malformations, not classified as a discernable syndrome, but reported as a unique case. However, the patient underwent to similar techniques as for those affected by bladder exstrophy complex (7). Therefore, she developed the same complications during pregnancy, as reported in bladder and cloacal exstrophy patients (8).

Even though a CS could have represented a risk for a damage of the bladder and a vaginal delivery might be considered as optimal, there was a significant risk for maternal surgical injury and neonatal sequelae due to the hostile abdomen, with related risk of delayed access to the fetus in an emergent situation during the labor. Hence, vaginal delivery could have been considered when the pregnancy is uncomplicated and a senior obstetrician and urologist should be available for emergency delivery (9). Surgical complications, such as injuries to the urinary reservoir, transection of the ureter, fistula formation, and postpartum hemorrhages, should not be underestimate (10).

Abdominal entry by paramedian incision could be chosen rather than classical or transverse incisions; this technique has been proposed for women with impaired abdominal access (*e.g.*, women with previous correction for exstrophy-epispadias complex) or severely kyphotic parturient (whose supine cannot be achieved) (11). The favorable aspects of this technique are based on the relatively avascular linea alba. Two variants are known: the “medial” paramedian incision, in which the rectus sheath and rectus muscles are transected close to the linea alba, and the lateral paramedian technique, which consists of a longitudinal incision near the lateral border of the rectus sheath. In this approach, the rectus muscle is separated and then medially retracted. This lateral retraction prevents dissection of the deep epigastric vessels. Finally, the posterior rectus sheath (above the arcuate line) and the peritoneum are opened in the same plane as the anterior rectus sheath (**figure 2**) (12). This technique is more complex than the midline incision, resulting in an increased opening time and potential blood loss. The possibilities for extend-

ing the incision superiorly are limited by the costal margin (13). A vertical or classical uterine incision at the upper uterus was completed in order to avoid any injury to the lower urinary tract. In the present case, we do choose the lateral paramedian technique trying to prevent any mesh transection. There are several reviews with regards to CS from the pre-operative to the post-operative care, in order to suggest the best standard (14, 15). Unfortunately, to the best of our knowledge, there are no reviews for standard care in those patients with hostile abdomen, except of small series reporting single center experience (8, 10, 11).

The lateral paramedian incision matches some of the advantages of the midline incision, such as wider exposure, richly vascularized wound bed, decreased risk of blood vessel dissection, and preservation of rectus muscle. Furthermore, the most remarkable characteristic of the paramedian incision is the significant reduction of incisional hernia incidence (approximately 0-1%). An explanation of this low rate is the so-called "shutter mechanism" the rectus muscle would provide in this approach: the muscle, located medially to the wound, would enable abdominal muscles contraction to bring the wound edges together (13).

CONCLUSIONS

CS represents a crucial point of care in women when complex comorbidities would advise against a vaginal delivery. Expertise in surgical options could act as a major ally when the optimal choice is necessarily directed towards alternative techniques. Furthermore, a multidisciplinary involvement is essential to provide the best management for these complex cases. A lateral paramedian abdominal incision could represent an appropriate option of care in those patients where classical CS procedure would be contraindicated.

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ETHICS

A written informed consent from parents has been achieved.

CONTRIBUTORS

Each author gave a substantial contribution for the preparation of the manuscript.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interests.

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