

Use of the "O" Wound Protector/Retractor in Extremely Obese Pregnant Woman - An Unexpected Event

Federico G Mariona^{1,*} and Karen L Plymel²

¹Maternal Fetal Medicine Wayne State University School of Medicine, Michigan Perinatal Associates, Dearborn, Michigan USA

²Beaumont Health Systems, Michigan Perinatal Associates, Dearborn, Michigan USA

Abstract

Background: Extremely obese pregnant women are a rapidly increasing group requiring obstetrical care. When surgical delivery is indicated they present a unique challenge.

Case: We submit the case of a pregnant woman with a body mass index (BMI) of 63Kg/m² (385 pounds) with a reduced pelvic outlet who selected to deliver by primary cesarean. A sub umbilical Joel Cohen incision was selected. The surgical procedure and delivery were uneventful. Twelve hours post-surgery a circumferential area of skin redness was present in the area where the wound protector-retractor was placed. We believe this represented an area of relative ischemia created by the pressure between the two plastic rings of the device. There was no pain or inflammation, the area returned to normal within 48 hours.

Conclusion: We are not aware of a similar case reported with the use of this device. Practitioners are alerted to this event and reminded that the deployment of the device must be carefully performed to avoid this possible deleterious effect.

Keywords: Extreme obesity; Joel Cohen incision; "O" wound protector-retractor

Introduction

Cesarean section is arguably the most frequently performed acute or elective abdominal surgical procedure in the world. This surgical procedure usually follows a very traditional and well described approach and technique [1]. A number of variations have been introduced in the presence of previous extensive or repeated abdominal surgeries or individual anatomic variants to improve the procedure and decrease or avoid post-surgical complications [2-5]. Maternal obesity is an increasingly frequent finding in obstetric practice. The combination of maternal obesity and cesarean section has increased significantly in recent years. Extreme obesity is increasing rapidly in the pregnant population. We studied a group of 249 pregnant women with extreme obesity, defined as women with a weight 225% above ideal body weight (BMI 50 Kg/m² or higher). Cesarean delivery, primary or repeat is a frequent occurrence [6].

Case Report

A 36 year old married Caucasian nulliparous presented for prenatal care at 12 weeks gestation. Her BMI was 63 Kg/m², body weight 385 lbs. Her pregnancy was unplanned and conception occurred without medical assistance. Her prenatal care was essentially uncomplicated. Her work up was positive for obstructive sleep apnea. She was fitted with an appropriate light weight continuous positive airway pressure (CPAP) system with significant improvement. Additional comorbidities included gestational diabetes treated with diet, hypertension needing no additional medications. Cardiac and anesthesia work up provided clearance for major surgery. During the last trimester manual pelvimetry revealed the presence of a markedly reduced pelvic outlet in both the antero posterior and transverse pelvic diameters. The need for a primary cesarean delivery was discussed with the parents, counseling was provided including all alternatives and a signed informed consent was obtained. An elective cesarean was scheduled for the 1st day of her 39th week.

The abdominal incision planning was conducted 48 hours prior to the day of surgery based on the existence of a markedly redundant pannus covering the lower abdomen and upper thighs.

She received prophylactic antibiotics prior to the incision. We utilized the anterior superior iliac spines to determine the position of the redundant pannus in relationship to the pubic symphysis. The skin incision was planned at 3 cm below the lower lip of the navel, in the transverse direction. Transabdominal US was performed on the same day to measure the distance from the skin to the anterior uterine wall along with the relationship with the lower uterine segment. A distance of 9 to 11 cm was obtained. The placenta was located on the uterine fundus and away from the planned hysterotomy area. The fetal vertex was presenting and floating above the pelvic brim. It was calculated that the subumbilical transverse incision would drop directly at the level of the lower uterine segment. An abdominal brace was utilized to mobilize the pannus cephalad prior to the incision.

Blunt and sporadic sharp dissection through the abdominal wall reached the anterior fascia which was opened transversely and expanded to the level of the skin incision. The peritoneal cavity was entered bluntly at the level of the lower uterine segment. The distance from the skin surface to the anterior wall of the uterus was measured at 24 cm. An extra-large Alexis™ O wound protector (21.5 cm diameter, 32 cm from ring to ring) was placed in the abdominal cavity; proper position was confirmed and the device was deployed following manufacturer's specifications. Tight wound edge attachment was obtained with an adequate sized surgical field accessing the lower uterine segment [7]. A low transverse segmental hysterectomy was performed 18 minutes after the skin incision. Fetal membranes were ruptured, the vertex was brought into the incision and a portable vacuum extractor was applied

***Corresponding author:** Federico G Mariona, Maternal Fetal Medicine Wayne State University School of Medicine, Michigan Perinatal Associates, Dearborn, Michigan USA, Tel: 1 313-593-5957; E-mail: fmарiona@att.net

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to the fetal head for the delivery without undue traction. Intravenous oxytocin was utilized to manage the third stage; placental was removed by controlled cord traction. The procedure continued routinely, the uterus was closed, hemostasis was obtained. The O protector was removed without difficulties. The abdominal wall was closed by layers including 4 layers on the subcutaneous tissue avoiding no approximated pockets. The braces utilized to support the pannus were removed and the skin was close with non-absorbable vertical mattress sutures without undue tension on the skin edges. Hemostasis was obtained at all levels with minimal use of cautery. The urine was amber color at the end of the procedure. EBL was 480 mL and the total surgical time was 72 minutes. She was moved to the recovery room via Hover™ mattress in stable condition with her baby. She received prophylactic anticoagulation twice daily until discharge.

Within 12 hours into the post op period a circumferential area of redness was present in the anterior abdominal wall in the area above and below the incision. This was diagnosed as cellulitis. The area of redness was not accompanied by fever, pain or swelling. The line of redness remained limited to above and below the area of the incision and appeared to coincide with the location of the external ring of the O retractor. Cultures that were obtained resulted negative. Areas in between the skin stitches were probed with a sterile instrument for the next 48 hours with no seroma or hematoma drained. The patient was actively ambulating, there was no dysuria and peristalsis was present. The line of redness took over 48 hours to clear. The incision remained dry, painless and healing. There was no maternal fever or unusual pain during the entire hospitalization. She was placed on oral antibiotics and went home with a peripheral venous lock to complete the antibiotic therapy [8] (Figure 1).

During her office visits in the subsequent days a spontaneous clear fluid drainage was seen on the left side of the incision. Several days later, abundant colorless fluid discharged from the extreme right side of the incision. The drainage occurred with no fever or pain. The patient remained afebrile, pain free, active and continued breast feeding her baby. The incision was frequently inspected, locally cleansed and healed with no further interventions. Patient permission for the case report was waived in the absence of identifier markers (Figures 2 and 3).

Comments

We reviewed in detail all the steps before, during and after the surgical procedure in search of an explanation for the event described



Figure 1: Circle of redness surrounding the incision site 12 hours post-surgical procedure.



Figure 2: Abdominal incision 7 days post-surgery.



Figure 3: Abdominal incision 15 days post-surgery.

which we had not previously experienced. We believe that at the time the O retractor was deployed, the resulting length of the plastic cylinder between the two semi rigid rings was shorter than the thickness of the abdominal wall at the level of the incision. We assume that this excessive tightness created by inadvertently over deploying the wound protector, caused excessive compression of the abdominal wall and the skin by the outer rigid ring with relative local ischemia and tissue hypoperfusion causing the described reaction. Additional tissue ischemia may have occurred in the fatty layer explaining the seroma formation and drainage in consecutive days.

We have used the O self-retaining wound protector-retractor in approximately 100 cesarean sections, approximately 49% of them in extremely obese parturient. This is the first time that we noticed this event. We searched for similar findings and found none and inquired the manufacturer, receiving no response. The distance between rings before the device is deployed is 32 cm. Following manufacturer's instructions, surgeons sequentially turn the outer ring until an adequate surgical field is obtained on the anterior uterine wall, usually 16 to 17 cm diameter and 360 degrees. These maneuvers usually stop when an appropriate size field is obtained or when no more turns are feasible. The distance between the two rings is usually not known and not measured. We tested the device outside of the surgical field. After 6 turns the distance between the inner edges of the rims is 10 cm. It is therefore plausible that there was excessive compression on the abdominal wall to cause at least 30 minutes of local ischemia causing the changes we described.

Conclusions

The self-retaining protector-retractor is recommended for several reasons. One, it allows for the use of less retracting instruments on the field (Doyen, Richardson, bladder retractor, Balfour); second, limits the number of assistants' hands on the field thereby reducing the risk of intraoperative contamination in these large women; third, assists in maintaining the large subcutaneous fatty layer, omentum and the loops of bowel away from the field until after the hysterotomy is closed and the device removed. On all accounts it is a valuable instrument. When we compared the occurrence of wound disruptions in this group of patients, between those on whom we used the device and those we did not, there was no statistically significant difference in wound disruptions. This case report allows for 3 clinical teaching points:

- I. Detailed prospective planning of uterine access incision in extremely obese pregnant women.
- II. Increase the usual careful execution of all surgical steps entering and closing the abdominal wall.
- III. Close post-operative follow up. In addition, to alert surgeons utilizing the wound protector-retractor in obese patients to be aware of the number of “twists” performed at the time of deploying the device as it relates to the thickness of the anterior abdominal wall. We recommend avoiding over deployment

of the device since it may be counterproductive and increase the chance of a wound complication. Our study continues as we evaluate all perioperative events in different populations of parturients.

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