



## Case report: post-cesarean section pressure injury after epidural analgesia-clinical and patient perspectives

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**Abstract:** Introduction: Pressure injury is one of the infrequent but well recognized complications after epidural analgesia. There are few published studies about pressure injury (PI) complicating epidural analgesia, including a report of three post-cesarean section (CS) women. We reported two cases of post-cesarean PI after epidural analgesia including clinical and, for the first time, patient perspectives. Case study: The current report discussed two cases of post-cesarean section, healthy, young patients who received postoperative epidural analgesia and developed pressure injury. Patients were admitted in September 2018 for elective cesarean section in OBGYN department in a private hospital, Jeddah, KSA. The operations were done under combined spinal-epidural anesthesia with spinal anesthesia was at the level of L4-L5. Surgeries were uneventful. They received epidural analgesia for postoperative pain control consisting of Fentanyl 2mcg/ml and bupivaine 0.125% and continued during day one postoperatively. Case 1 is 28- year-old, started complaining of left heel pain 36 hours postoperatively with no visible abnormality on examination. Few hours later, she developed stage 2 pressure injury manifested by a painful blister in her left heel 6\*7 cm. Local soothing cream was applied. The pain decreased gradually as well as the blister size. It took 2 months to dry leaving a hyperpigmented black area. Case 2: 37- year-old, started complaining of severe pain in her left buttock around 30 hours postoperatively. There was stage 1 pressure injury appeared as non-blanchable erythema on her left buttock 6\*7cm, and left heel 3\*3cm. The wound was managed by wound care team. Both patients had sensory and motor block, they did not receive pressure injury preventive measures as regular turn and pressure relieving mattress. Both cases improved uneventfully. Conclusion: Pressure injury can complicate post cesarean section epidural analgesia in young healthy persons. PI has a significant psychosocial impact especially in postpartum patient. Health care providers should be aware and inform the patient about this uncommon but serious complication.

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### 1. Introduction

The rate of cesarean deliveries has increased worldwide. (3, 4) As any surgical procedure, pain is a common complaint postoperatively. Severe acute postpartum pain found to increase the risk of persistent pain by 2.5-folds in addition to increasing postpartum depression. (5) The Royal College of Anaesthetists recommended epidural analgesia as a safe and highly effective postoperative pain control method after cesarean section. (1) Pressure injury (PI) is one of the infrequent but well recognized complications of epidural analgesia. (2) Literature review yielded number of studies most of them were old case reports. (6- 10) A national audit in two hospitals revealed PI incidence around 23% among

patients who had postoperative epidural analgesia. (10) It thought to be related to the deep motor block and nursing care. (7, 10) However, only one old report of 3 cases found describing PI after epidural analgesia in post cesarean section patients, (9) other studies were in different surgical practices. The current study discusses two cases of post-cesarean section, healthy, young patients who received postoperative epidural analgesia and developed PI. The study was approved by the hospital IRB, and written patients' consents were obtained. This report expressed, for the first time, the patients' perspectives on this complication. In addition, it added recent cases to the existing few old ones, and from different geography. It could thereby help in understanding the clinical

presentation, predisposing factors, impact of the problem to guide the future research and prevent this complication.

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## 2. Case report

### Clinical presentation

The current report discussed two cases of post-cesarean section, healthy, young patients who received postoperative epidural analgesia and developed PI. Patients were admitted in September 2018 for elective cesarean section in OBGYN department in a private hospital in Saudi Arabia. To the best of our knowledge, this is the first work that describes PI after epidural analgesia outside Europe, Western Pacific and Americas. The operations were done under combined spinal-epidural anaesthesia. With the patient in the sitting position and under a standard aseptic technique the spinal anesthesia done at L4-L5 midline using 25 Gauge pencil-point spinal needle, CSF noted but no blood. The space was located easily at the first attempt. Heavy Bupivacaine 0.5% and Fentanyl 25 mcg injected. Lidocaine and epinephrine were used for test dose. A catheter was inserted and left in the epidural space. No CSF or blood could be aspirated through the catheter. Sensory block was at T12 during the operation.

Patients were lying supine on the operating table. No perioperative hypotension or hypothermia were documented. They then received epidural analgesia for postoperative pain control consisting of Fentanyl 2mcg/ml and bupivacaine 0.125% in day one postoperatively. Sequential Compression Device (SCD) was applied after the operation and kept in place till the patients started walking. Both patients developed PI while in-hospital. For both cases, the incident was reported.

### Case one

28-year-old, healthy woman. Gravida 4 Para 1+2, 38+5 weeks pregnant. Height: 156 cm, Weight: 60.65 kg. BMI: 24.92. The current pregnancy had been unremarkable. Previously she had one unremarkable cesarean section without postoperative epidural analgesia, and two spontaneous first trimester miscarriages. She was admitted for elective cesarean section due to previous one. The patient was consented for spinal-epidural analgesia before the operation; there were no contraindications. She denied any health problems related to her back or lower limbs. The procedure length was 63 minutes from the time of induction, (52 minutes the operation length). She delivered alive baby boy. Blood loss was 600 ml.

Urine output 200 ml. Temperature 36.8 by the end. Hemoglobin 11.3 gm/dl, blood group O negative. She continued on postoperative epidural analgesia for pain control based on her request, consisting of Fentanyl 2mcg/ml and bupivacaine 0.125% at a rate of 10-13ml hr-1 and continued for a day postoperatively. Sensory block was at L2 level. Motor block in left lower limb was Bromage score 2-3 (Able to move feet only but unable to extend knees-unable to move), right side was 1-2 (Just able to move knees and feet-Able to move feet only). Sequential Compression Device (SCD) was applied on both legs. Patient started mobilization late in day one around 34 hours after the operation due to the motor block.

The patient started complaining of left heel pain around 36 hours postoperatively with no visible abnormality on examination. Few hours later, she developed stage 2 PI appeared as a small blister 2\*2 cm with tolerable pain. Next day morning, the blister size enlarged significantly reached 6\*7 cm with surrounding redness and severe pain, 10/10 pain score. It interfered with walking. Local creams Fucidic acid and Reparil (Aescin and Diethylamine Salicylate) gel were applied. Her foot was kept slightly elevated, not touching the bed. The pain decreased gradually but very slowly as well as the blister size. The blister content was watery, then became bloody, and the blister left intact till dried and peeled off. It took around 2 months to dry. The blister left a hypopigmented dried black hard area around 1\*2 cm, which caused pain when pressed like during walking. She has numbness in the 1st and 2nd left toes of the same degree since the day of discharge from hospital. She developed left leg ache from the knee down to the foot started 2 months after discharge home. The patient main concern was the possibility of having a serious condition that caused these symptoms. Her symptoms affected her psychologically rather than physically. She was not on pain medications. The patient visited a vascular surgeon in Jan 2019, he examined the area and reported that there were no vascular abnormalities, no signs of cellulitis over left heel, and the distal pulses were well palpable. Patient was referred to neurologist; he confirmed the diminished sensation and weakness in the left leg. Bladder and anal sphincter control were maintained. No sensory level by examination, but an ill-defined area of paraesthesia over the left foot mainly 1st and 2nd left toes. All reflexes in the lower limbs were normal. Otherwise, the patient was well and examination was unremarkable. Blood tests including CBC, CK were within normal range. He ordered magnetic resonance imaging (MRI). The scan showed central disc protrusion at the level of L4-L5, indenting the theca sac with no stenosis of the neural foramina. Disc

dehydration is noted at the same level. The patient was treated with simple analgesia and physiotherapy. The pain decreased gradually as well as the blister size. She was discharged home with blister size of 1\*2 cm without pain.

#### Case 2:

37-year-old, healthy woman. Gravida 5, para1+3; 38 weeks pregnant. Previous one cesarean section and three miscarriages, known case of factor V Leiden deficiency with strong family history. Weight: 59.8 kg, Height: 155cm.

#### BMI:

24.89 kg/m<sup>2</sup>. The operation was done under combined spinal-epidural anaesthesia consisting of Fentanyl 2mcg/ml and bupivaine 0.125%. The operation last 67 minutes from induction time (procedure length 49 min). She delivered alive baby boy. Blood loss 300 ml, urine output: 200 ml. Temp 36.7. Hb 10.6, blood group B+ve. During surgery she had no documented hypotension. She received epidural analgesia for postoperative pain control based on her request, consisting of Fentanyl and Bupivacaine started at 12ml hr<sup>-1</sup> and continued for 21 hours. SCD machine was applied in both legs. Level of sensory block was at T10-T12. Motor block was Bromage score 1 (just able to move knees and feet, unable to raise extended legs) in both sides. Patient started mobilization late in day one, around 30 hours after the operation. Patient started complaining of pain in her left buttock on day 1 few hours after removal of epidural catheter. There was non-blanchable erythema on left buttock and left heel with severe pain that prevent her from lying or pressing on that areas (stage 1 pressure injury). Reparil gel was applied. Wound care team assessed the patient in day 2, they recommended to apply Cavilon spray (an alcohol-free liquid barrier film) on the affected areas and Mapelix foam dressing, off load the pressure from left heel by elevating the leg. She was encouraged to lie on the right side and advised not to give pressure on her left side. The wound was managed by wound care team. The pain subsided after a week and the medications stopped. The injury in the back healed after 3 weeks but left hyperpigmented area. The heel injury recovered after around 4 weeks. For both cases, the incident was reported and the cases were recorded in the risk log.

### 3. Patient perspectives

#### Case 1

"Until now I don't understand why this happened! I'm so worried about this! Was it because my foot was entrapped on the bed and I didn't notice due to the epidural?!"

"The pain was so intense, and the skin was so tight to the point that I couldn't tolerate the pain and I

finally popped it (the blister)!"

"The doctor told me the remaining pain, both in my leg and heel, has no relation to the blister or epidural? I know that epidural puncture must be the cause of all that I went through!"

"I don't know who to go to, which department?! Is it dermatology, neurology, orthopedic, vascular diseases."

"The creams that I was given didn't help or have any relation, since the problem was internal!"

"I woke up from sleep and found it (the blister) getting bigger! I was very shocked by the look of it! Imagine, the pain of the blister was way more intense than the pain from my Cesarean wound! It is a constant nagging pain, I forgot all about the cesarean pain. I'd give it a 15 out of 10!"

"I was very concerned about my leg, what will happen after that, will I be able to walk again?! I was very worried about the blood vessels in my leg; it looks like the foot of diabetics, when they all of a sudden need to amputate their legs! I read a lot about what happened to me, it is like gangrene. The same pictures of gangrene! I read a lot about what has happened to me; it is similar to gangrene; its symptoms and shape and all."

"I was very angry, that I couldn't get myself to go the hospital! first because I couldn't walk on my foot! Also because I came several times and they kept sending me back and forth! What I mean is that my situation was not solved by one visit to the hospital. It was very difficult for me to go through. I spent a month and a half after the surgery unable to walk! That was the most annoying part. I had to get customized shoes to help me walk! The shoes were designed to prevent the blister from touching the sole of the shoes. My assessment of the outcome is it was very poorly handled."

#### Case 2

"The pain was very severe to the point that I was unable to sit or lay on my back. When my friends were visiting me I was standing on my feet the whole time!"

"I had no pain after the OR, and I was very happy. I told people that they can come visit me from the first day. But then the pain started to get so bad! I did not want to see anybody! The second and third days after the cesarean were horrible. It was very annoying, worse than the cesarean pain itself."

"After my first cesarean, I did not have an epidural. Even though, the pain was severe on the first day and I was forced to walk with the pain, but then I became better. I expect the situation to be better with an epidural, but it was actually worse."

"The spray I used relieved the pain pretty well. Thanks god, the total outcome was good. The care, interest, and nursing staff were great."

#### 4. Discussion:

Pressure injury is associated with significant morbidity, mortality, and budget load. (11) We reported PI in healthy, young, parturient women who are at low risk of PI development. However, similar cases have been reported including postcesarean section, (9) post labour epidural analgesia, (12) and post abdominal surgeries (13-15) in young, fit, patients. To the best of our knowledge, no similar study has been reported in the Middle East or Arab countries.

The causes behind this complication have not been studied adequately in literature, no interventional study has been found by literature search. There are some reported risk factors for PI following epidural analgesia. Perioperative hypotension, (16, 17) smoking, (17) multiple diseases burden, (17) female gender, (17) neuraxial blockade or peripheral nerve block, (18) lumbar epidural insertion (19) all are documented factors. However, motor and sensory block is the predominant risk factor reported. (8, 15, 20) Nevertheless, all those factors per se are predisposing to PI even in the absence of epidural analgesia, so proved association is still lacking.

Our cases had some of these factors; both of them had neuroaxial anaesthesia, lumbar epidural insertion, motor and sensory block for long hours with immobilization. In addition, PI preventive measures were not applied especially risk assessment and pressure relieving methods. In both cases, pressure changes was discovered when the patient started feeling pain after the recovery from epidural sensory block.

This finding is consistent with published reports in which patients did not received pressure relieving methods including pressure relieving mattresses, and regular turn. (6, 7) Patient with motor and sensory block should be treated like paraplegic persons with regular turns to relieve pressure over bony prominences and prevent PI. (6, 7, 15, 18)

Our cases received epidural analgesia with bupivacaine 0.125%. PI was reported with bupivacaine 0.25%, 0.125%. (19, 21) but no PI with the concentration of 0.0625%(22) which was attributed to the absence of sensory and motor block.

Patient perspectives reviled a significant psychosocial disturbance as a result of PI which outweigh the degree of postcesarean section pain.

#### Conclusion:

Pressure injury can complicate postoperative epidural analgesia in young healthy persons. Health care providers should be aware about this serious complication. Preventive measures should be applied including risk assessment, pressure relieving method, and avoidance of deep sensory and motor block.

However, these factors are questionable as we lack interventional studies that prove the association. The primary “take-away” lessons of this case report is to counsel the patient about this infrequent but serious complication when consenting for postoperative epidural analgesia. Further studies are needed to prove the association and help in its prevention.

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