CASE REPORT

Severe pelvic abscess formation following caesarean section

Dana A Muin,¹ Martin Thanh-Long Takes,² Irene Hösli,¹ Olav Lapaire¹¹Department of Obstetrics, University Hospital Basel, Basel, Switzerland²Department of Radiology, University Hospital Basel, Basel, Switzerland

Correspondence to Professor Olav Lapaire, olav.lapaire@usb.ch

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SUMMARY

We report a case of a 24-year-old woman with severe pelvic abscess formation 2 weeks after secondary caesarean section. The isolated pathogens were a mixture of *Gardnerella vaginalis*, *Mycoplasma hominis* and *Ureaplasma urealyticum*. After initial resistance to systemic antibiotic treatment, she underwent radiologically-guided drainage of the abscesses, whereon she had a continuous recovery.

BACKGROUND

The most common obstetric infection is postpartum endometritis mainly due to three risk factors, namely caesarean section, lack of prophylactic antibiotics and the presence of certain pathogens during labour.¹ The most common risk factors for postcaesarean endometritis are young age, low socioeconomic status, long labour, long duration of ruptured membranes, multiple vaginal examinations and delivery for cephalopelvic disproportion.^{2–4} In absence of antibiotic prophylaxis, up to 30–40% of women undergoing unscheduled caesarean section may develop postoperative infection, whereas the incidence after planned caesarean section is less than 10%.⁵ Postpartum pelvic abscesses occur in less than 1% of patients in sequel to an endometritis, with the most common sites being the leaves of the broad ligament, posterior cul-de-sac and between the bladder and anterior uterine wall.² In the past decades, with the widespread use of antibiotic prophylaxis, the incidence of postpartum infection has declined, however, severe outcomes are still deemed to occur. We report a case of extended unilateral tubo-ovarian and pelvic abscesses involving the retrovaginal and retroperitoneal space secondary to infection with *Gardnerella vaginalis*, *Mycoplasma hominis* and *Ureaplasma urealyticum* after unscheduled caesarean section.

CASE PRESENTATION

A 24-year-old Caucasian gravida I para 0 with uneventful medical and obstetric history was admitted to our delivery unit for induction of labour at 41+4 gestational weeks. She was induced with 10 mg dinoprostone (using a Propess slow release vaginal delivery system) for a duration of 20 h after which the system was removed on regular contractions. The first stage of labour took 5 h, however, the second stage of labour was obstructed for more than 2 h and vaginal examination revealed occipito-posterior rotation. The decision was made for epidural anaesthesia followed by oxytocin infusion at

9 cm cervical dilation. Rupture of membranes was performed and showed thick meconium-stained liquor. In view of this finding along with a pathological cardiotocogram, the indication of a secondary caesarean section was announced upon patient's verbal and written consent. Preoperatively, the patient received an intravenous (iv) single shot of antibiotic prophylaxis with amoxicillin and clavulanic acid 2.2 g. Standard operation procedure was performed and the abdomen incised via transverse incision. Upon incision of the uterus and amniotomy, the thick meconium-stained liquor was suctioned and a male newborn delivered from first occipito-posterior cephalic position with the umbilical cord wrapped around his neck once. While the initially depressed baby boy was taken care of by the present neonatologists (APGAR 2/9/10; weight 4135 g, body length 51 cm, head circumference 37 cm; pH umbilical artery 7.22, pH umbilical vein 7.32), the macroscopically unremarkable placenta was delivered by umbilical cord traction, the uterine cavity was cleared of remaining amniotic membranes and the uterus was closed in a standard one-layered fashion. Firm uterine tone was maintained by a single intravenous shot of 100 µg carbetocin (Pabal). Prior to closure of the rectus sheath and skin, the pelvis was cleaned with warm and sterile normal saline washout and remaining fluid was suctioned out. No intraoperative complication was reported.

The first postoperative days were uneventful and the patient was discharged in stable health with good scar healing on the fifth postoperative day. Three days later, the patient presented to the emergency unit with lower abdominal pain, green vomit and diarrhoea, with recurrent fever episodes up to 39°C. On admission, the patient was febrile with a temperature of 38.8°C, her abdomen was soft with tender uterus and adnexae on palpation but with no guarding or rebound. Uterine fundus was 1 cm below the umbilicus.

INVESTIGATIONS

On vaginal examination, there was malodorous discharge of which swabs were taken for Gram stain, culture and sensitivity and there was cervical motion tenderness. On transvaginal ultrasound, free fluid was seen in the pouch of Douglas. The diagnosis of postoperative endometritis was made and the patient re-admitted for intravenous antibiotic treatment with amoxicillin and clavulanic acid 2.2 g three times a day (TDS). On the first 2 days, further inpatient examinations included stool cultures, which were negative for *Clostridium*

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Figure 1 Postoperative laboratory results (0–30 postoperative days).

difficile, *Campylobacter jejuni/coli*, *Salmonella* and *Shigella* and blood cultures taken at the peak of the patient's temperature on day two of her readmission showed no growth of aerobes or anaerobes. The vaginal swab on admission revealed *G. vaginalis*. The curve of her infection markers (C reactive protein, leucocytes) and the temperature curve are shown in figures 1 and 2. Despite high-infection markers, the patient claimed to be improving under antibiotic therapy with amoxicillin and clavulanic acid. In view of the undulating fever curve, a repeat ultrasound was performed on day 4, which showed a normal endometrium but inhomogeneous mass in the pouch of Douglas (figures 3 and 4), for which a CT scan was performed for further investigation (figures 5–7). In total, four abscesses were described, involving the right adnexa (59×57×68 mm), on the left bladder site (43×17×40 mm), between the cervix and iliopsoas muscle (35×34×32 mm), and in the posterior cul-de-sac (71×44×57 mm). The abscess at the right adnexae was drained under CT-guidance, and from the abscess in the pouch of Douglas 100 mL pus was suctioned under ultrasound guidance.

In both drainage samples *G. vaginalis*, *M. hominis* (>10 000 KBE), *U. urealyticum* (>10 000 KBE) and *Actinobaculum schaalii* were cultured.

TREATMENT

On the recommendation of local hospital microbiologists, therapy with intravenous amoxicillin and clavulanic acid 2.2 g TDS and oral clindamycin 300 mg TDS was continued for 2 weeks under which the infection parameters showed a rapid decline with no further temperature spike. The patient was discharged in good health 7 days after the abscess drainage. The antibiotic therapy was changed to oral ceftriaxone 2 g once daily, metronidazole 500 mg twice daily and clindamycin 300 mg TDS.

OUTCOME AND FOLLOW-UP

A follow-up appointment for clinical and sonographical reassessment was arranged after 10 days and showed a normal appearing uterus and endometrium with the abscess in the retrovaginal

Figure 2 Postoperative temperature curve.

Figure 3 Ultrasound imaging of collection in pouch of Douglas (53.16×46.38 mm).

space with a regressing size of 13×19×37 mm and the abscess in the right adnexa and ovary being stable at 42×49×41 mm. Clinically, the patient felt well and reported no further temperature spike, and her infection parameters were back to normal levels.

DISCUSSION

Pelvic abscess formation is a rare complication in the postpartum period, accounting for today's widespread use of antibiotics. We presented a rare case of rapid abscess formation involving four pelvic sites with approximately 300 mL of pus collection within 2 weeks after secondary caesarean section despite antibiotic prophylaxis. In retrospect, we can identify six risk factors that could have facilitated the severe postpartum infection: Following labour induction with dinoprostone and due to cephalopelvic disproportion the patient had been in obstructed labour and was therefore examined frequently to assess progress in the second stage. When she ended up in secondary caesarean section, she was dilated at 9 cm, thus facilitating vaginal microflora with potentially pathogenic anaerobic bacteria to enter the uterine cavity during the operation. Also, the meconium-stained liquor might have been infected with pathogens and consequently contaminated the myometrium, pouch of Douglas and retropubic space at time of delivery despite the intrapartum washout with normal saline. Pathogens

Figure 4 Ultrasound imaging of tubo-ovarian abscess formation on right side.

Figure 5 CT imaging of abscess formation in rectouterine excavation in sagittal plane (71×44×57 mm; yellow arrow).

known to be of high virulence for postpartum and postoperative infection include *U. urealyticum* and *M. hominis*,⁶ of which the patient was found to be positive besides *G. vaginalis* and *A. schaalii*. Considering those factors, the single-shot prophylaxis with a broad-spectrum antibiotic might have been insufficient.

The patient's presenting symptoms of diarrhoea and vomiting initially prompted us to consider either a gastroenteritis or an intraoperative bowel injury accompanying the postpartum endometritis. However, the clinical aspect, with a tender uterus on palpation, presence of an undulating fever curve and non-infected stool cultures, led us to sonographical and subsequent radiological investigations that confirmed four underlying abscesses. Pelvic abscesses usually start with the clinical picture of an endomyometritis. When treatment success becomes refractory to antibiotics and symptoms deteriorate with recurrent temperature spikes, tachycardia, tachypnoea and an unusually

Figure 6 CT imaging of abscess formation in the right adnexa in coronal plane (59×57×68 mm; yellow arrow).

Figure 7 CT imaging of abscess formation in the right adnexa in transverse plane (59×57×68 mm; yellow arrow).

tender uterus, further investigations should be conducted. Unless abscesses are located at the apex of the vaginal vault or in the subcutaneous tissues of the caesarean incision, they are hardly accessible for palpation and only localisable in the pelvis through ultrasound or CT imaging. Treatment of choice in encapsulated purulent processes is surgical drainage, which can be performed percutaneously by interventional radiology.⁷ Exudative material should be obtained for Gram stain, culture and sensitivity.

It has been shown that the size of the abscess correlates with duration of hospitalisation and need for surgical intervention.^{8 9} In tubo-ovarian abscesses, every 1 cm size was associated with an increase in inpatient duration by 0.4 days. The average abscess size for drainage and/or surgery was 7.7 cm; abscesses greater than 8 cm were associated with increased complication rates as in intra-abdominal rupture.⁸ Hence, an abscess of over 10 cm size should be removed surgically or by drainage with concomitant antibiotic therapy. Potential routes for drainage are transvaginal, transrectal, transabdominal and transgluteal under radiographical guidance.^{10 11}

The success rate of broad-spectrum intravenous antibiotics alone in women with pelvic abscess ranges between 34% and 88%.¹² Hence, antibiotic treatment with a broad-spectrum parenteral antibiotic should be started promptly and continued until the patient has been afebrile for 48 h.⁹ Thereafter, the patient can be started on oral antibiotics for 10–14 days in total. In gynaecology, a recommended regimen for postoperative infections is the combination of clindamycin or metronidazole plus penicillin or ampicillin plus gentamicin. Alternatively, extended spectrum cephalosporins, penicillins or carbapenems may be used as single agents (level I evidence).¹³

As in pelvic inflammatory disease, potential sequelae of pelvic abscesses include secondary infertility, ectopic pregnancy, chronic pelvic pain and hydrosalpinx.^{7 14–16} This should be still taken into account and discussed with the patient after successful treatment outcome and options for further diagnostic investigations offered in due course.

CONCLUSION

By writing this case report we wanted to show an unusual development of severe postcaesarean pelvic abscesses despite antibiotic prophylaxis. The points to consider are the appropriate choice of antibiotics according to culture and sensitivity, if provided and the individual risk factors that might be associated with delivery. As potential long-term sequelae of pelvic abscesses in this young patient, infertility due to secondary scarring involving the fallopian tubes and ovaries should be considered in postpartum counselling.

Contributors DAM, MT-LT, IH and OL made substantial contributions to the conception, design of the work, the acquisition, analysis and interpretation of data for the work. DAM, MT-LT, IH and OL participated in drafting the work and revising it critically for important intellectual content. DAM, MT-LT, IH and OL approved the final version to be published. DAM, MT-LT, IH and OL were to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Competing interests None declared.

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