

Case Report

Ultrasound-Guided Retrieval of a Retained Needle after Caesarean Section in a Low-Resource Setting: A Case Report

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Abstract: Background: Caesarean section is one of the most common surgical procedures and it can be complicated by postpartum haemorrhage, requiring additional suturing. Retained surgical needles during Caesarean section (CS) are rare but serious complications, and are particularly challenging in low-resource settings. We present a case managed in a remote hospital in Lamu County, Kenya without access to advanced imaging or specialist input at the time of surgery.

Case Presentation: A 26-year-old patient underwent emergency CS at 38 weeks for failure to progress. Postpartum haemorrhage from the placental bed in the posterior uterine wall happened and required suturing. Unfortunately, the needle became detached and was lost within the myometrium. The needle could not be retrieved intraoperatively because of continuing bleeding, leading to poor visibility and the need to close the uterus. Therefore, the decision was made to leave it in situ for later retrieval. Further evaluation and discussion with a multidisciplinary team were conducted. Surgical removal was performed because of the potential risks. No advanced imaging including CT or fluoroscopy was available, and ultrasound scanning was successfully used to localize the needle preoperatively and also guide the retrieval intraoperatively, through a posterior uterine wall incision. The patient's recovery was uneventful and she was discharged on the third postoperative day. **Conclusion:** This case illustrates the feasibility and effectiveness of using ultrasound to manage a retained uterine needle in a low-resource setting. Real-time ultrasound is safe, minimally invasive, and available, and helps avoid complications. Early communication with the patient and multidisciplinary teamwork were key to successful outcomes.

Keywords: Retained Surgical Needle, Caesarean Section, Ultrasound-Guided Retrieval, Postpartum Haemorrhage, Low-Resource Setting, Kenya.

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INTRODUCTION

Caesarean section is one of the most common surgical procedures, and the current global rate is around 21% (Betran *et al.*, 2021). Postpartum/peripartum hemorrhage (PPH) is an obstetric emergency complicating 1–10% of all deliveries and is a leading cause of maternal mortality and morbidity worldwide (Bláha *et al.*, 2022).

Retention of a surgical item (RSI) is an uncommon, preventable event that can result in patient injury. RSIs are more common in emergency cases, and it can cause complications such as pain, infection, a granulomatous response with an abscess, fistula formation, or intestinal obstruction, while organ damage, bowel perforation, sepsis, severe pain, and even death

can be caused by retained clamps, needles, and retractors (Lovrec *et al.*, 2018). Retained needles, in particular, pose challenges in diagnosis, localisation, and retrieval. In low-resource environments, these difficulties are compounded by limited access to imaging technology, specialist expertise, and surgical equipment.

Preoperative and intraoperative imaging is crucial in successful localisation and retrieval of RSI. Imaging includes plain X-ray, fluoroscopy, MRI, CT and ultrasound (Wodoslawsky *et al.*, 2023). Some of these technologies are expensive and might not be available in low resource settings.

This case highlights a retained uterine needle during emergency Caesarean section and its successful

retrieval using ultrasound guidance in a remote hospital in Lamu County, Kenya.

CASE PRESENTATION

We present a case of a 26-year-old patient, who underwent an emergency Caesarean section (CS) at 38 weeks in her second delivery, for failure to progress. The procedure was performed by a Resident Medical Officer, in July 2024 at King Fahd Hospital in Lamu, which is a remote area in eastern Kenya.

Following delivery of the placenta, the patient developed postpartum haemorrhage. Sutures were placed in the placental bed at the posterior wall of the uterus to control the bleeding. The surgical needle detached from the suture and became embedded within the uterine musculature. The needle could neither be visualized nor palpated, and bleeding has continued. General surgeons were called to assist as there was no Specialist Obstetrician & Gynaecologist available. Further attempts to locate and retrieve the needle were unsuccessful. Given the time already spent, and the need to deal with the ongoing haemorrhage, the decision was made to leave the needle in situ for later retrieval. The uterus and abdomen were closed, the bleeding was controlled, and the surgery was completed.

The situation was explained to the patient and her family afterwards. The patient received prophylactic antibiotics for five days, and her immediate recovery was uneventful.

On the 7th postoperative day, and following the arrival of the newly appointed Specialist Obstetrician and Gynaecologist, a detailed discussion was held with the patient and her family. The risks and benefits of retrieval, as well as timing, were fully explained. A multidisciplinary team (MDT) meeting was convened, including a visiting Obstetrician and Gynaecologist from the UK (present as part of a medical camp), a Consultant

General Surgeon, and the Health Minister of Lamu County. The consensus recommendation was to proceed with immediate surgical removal of the needle, given the potential risks and the current availability of appropriate expertise.

Imaging options were limited to a plain X-Ray, as no CT scan was available. An antero-posterior view was of poor quality but showed a faint shadow of the needle still in situ. The exact position of the needle could not be determined in a single plane, and the addition of a lateral film was not helpful. Therefore, an abdominal ultrasound scan was used to better locate the needle, and showed the needle as a hyper-echoic line with posterior shadowing in the posterior wall of the uterus.

Surgical retrieval of the needle was performed the next day. The original uterotomy incision was lower than the skin and sheath incisions. Real-time intraoperative ultrasound was employed for guidance, and the probe was enclosed in a sterile glove, with the cable covered with sterile adhesive tape to maintain asepsis. The echogenic reflection of the needle was identified in the middle of the posterior wall close to midline. A vertical incision about 2 cm was made in the posterior uterine wall directly over the reflection. This was higher and more towards the midline than anticipated. The needle was located deep within the tissue close to the endometrium and was successfully retrieved.

The patient's postoperative course was uneventful, and she was discharged on the third day.

The entire situation, including the retrieval and outcome, was explained to the patient and her family, who expressed relief and satisfaction with the care provided.

Appendix

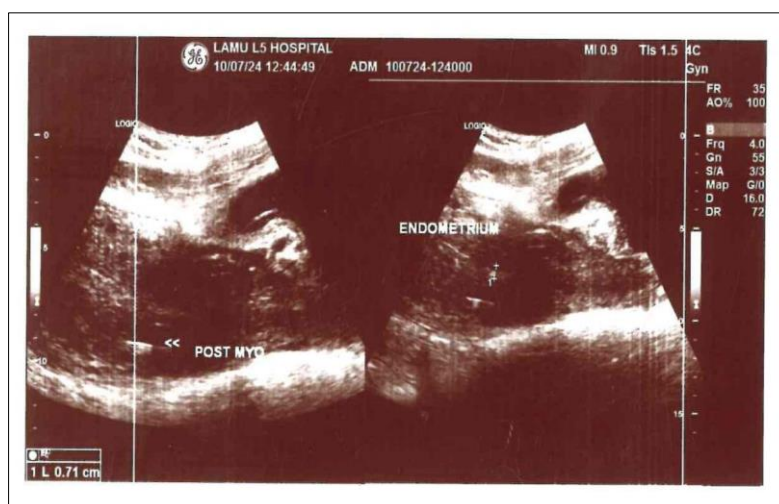


Image 1

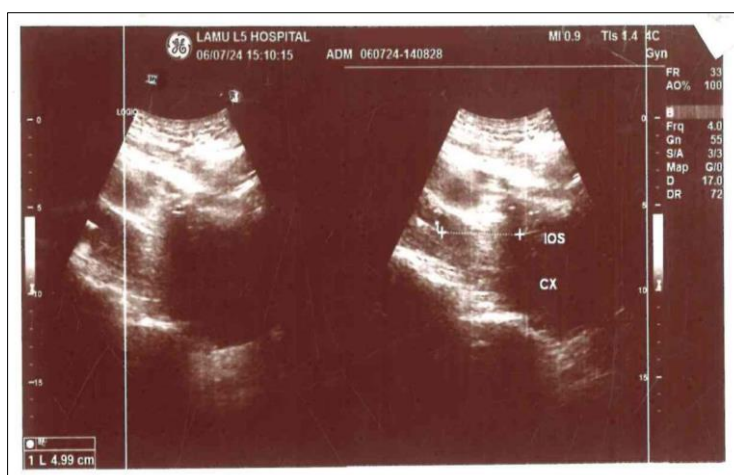


Image 2

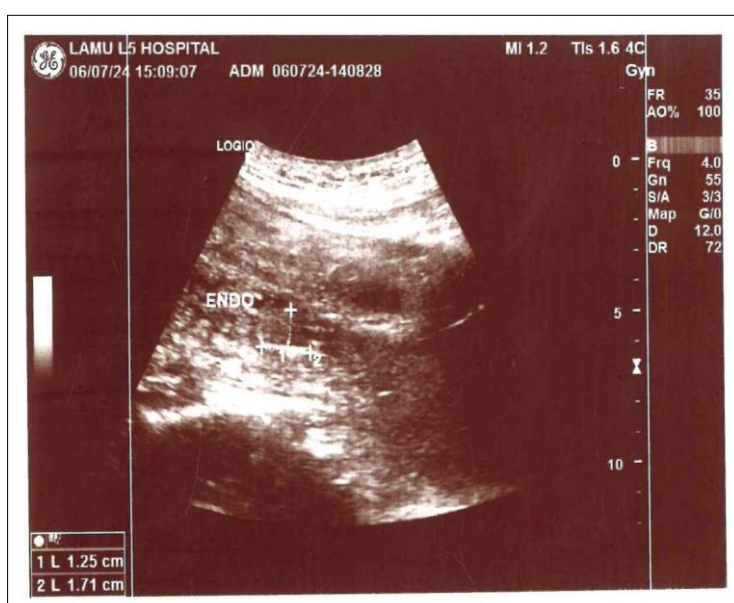


Image 3

DISCUSSION

This case illustrates the unique challenges of managing RSIs in low-resource environments and highlights practical strategies to overcome them. The use of intraoperative ultrasound for locating and retrieving a retained uterine needle proved to be a safe, low-cost, and effective solution.

Other imaging techniques including CT and fluoroscopy, are more accurate in locating retained needles and are more in common use, but they are expensive and not available in remote places. Ultrasound, as demonstrated in this case, can fill that gap, especially when performed by trained personnel using available machines. Its value has been previously documented in ophthalmology and episiotomy-related retained needle cases (Kieval *et al.*, 2009; Matthys *et al.*, 2023). Also, Wodoslawsky *et al.*, 2023, used transvaginal ultrasound scan to locate a lost needle in the uterine cervix. Instruments for retrieval can include

laryngoscopy alligator forceps through a sheath, which minimises trauma (Matthys *et al.*, 2023). It is important to use a lower frequency probe to view the whole thickness of the uterus clearly.

FIGO guidelines on prevention and treatment of postpartum hemorrhage in low-resource settings recommend the use of hydrostatic intrauterine balloon tamponade. It emphasises that conservative approaches should be tried first, rapidly moving if these do not work to more invasive procedures. Compression sutures and uterine, utero-ovarian, and hypogastric vessel ligation may be tried, but in cases of life-threatening bleeding subtotal (also called supracervical) or total hysterectomy should be performed without delay (Lynch, 2006). In this case, leaving the needle in situ initially was justified due to ongoing active bleeding, and aided in prevention of further deterioration.

Conservative management of RSIs has been reported in other anatomical regions (Khoiwal *et al.*,

2022). They acknowledged that surgical needles made of stainless steel, when left inside the body, become covered by a layer of fibrous tissue similar to that which occurs with other metal implants. Kazmi *et al.*, postponed retrieval of a lost needle in the perineum for 6 weeks to allow edema and inflammation to settle (Kazmi *et al.*, 2020). However, in our case, there would be higher risk as retained needle in the uterus poses higher risks due to uterine contractility and involution post-delivery. On the other hand, leaving the needle poses risks of infection, migration, and injury to adjacent organs, and retrieving the needle can be challenging, including failure to find it, resulting in bleeding and potential hysterectomy. It is acknowledged that blind exploration of the needle can be demanding and can cause massive dissection and significant hemorrhage (Roychowdhury *et al.*, 2008).

Prompt, honest disclosure to the patient and family, with a plan for follow-up, helped preserve trust and defuse legal threats. This emphasizes the importance of clear communication in adverse events, especially in systems with limited legal protection. Swetala *et al.*, stressed that early disclosure of a retained needle during the repair of an episiotomy or a perineal tear is very important in order to avoid retrieval complications and medico-legal implications (Swetala *et al.*, 2021).

Intraoperatively, a posterior wall incision was chosen as it provided direct access to the needle's location and avoided an additional incision in the anterior wall above the original uterotomy. It was acknowledged that it carries risk of subsequent bowel adhesions. It is important to point out that the needle was higher than the uterotomy incision due to involution of the uterus. The patient was advised on future pregnancy risks, including risk of uterine rupture, and the need for planned CS at 37 weeks.

A magnet was tried to locate the needle, on advice of an Ophthalmologist in the group from the UK, but failed, mostly due to the deep location of the needle and its relatively small size. That is similar to (Jayadevan *et al.*, 2014) in their protocol to recover needles lost during Minimally Invasive Surgery.

Nevertheless, the case shows that with careful planning, teamwork, and creative use of basic resources, complex surgical problems can be addressed successfully in low-resource settings.

CONCLUSION

This case underscores the complex challenges faced in managing retained surgical items, particularly in low-resource and remote healthcare settings. Despite the absence of advanced imaging technologies, safe and effective management was achieved through use of ultrasound, clear communication, and multidisciplinary collaboration.

The successful use of real-time ultrasound guidance for both preoperative localization and intraoperative retrieval of a retained needle in the uterus demonstrates its practicality and value as an accessible tool in similar environments. Furthermore, this case highlights the importance of timely disclosure, patient-centered approach, and shared decision-making in preserving trust and avoiding medico-legal repercussions.

Ultrasound training and structured protocols for retained foreign body management may help improve outcomes in comparable settings. With thoughtful innovation and teamwork, it is possible to provide safe, high-quality surgical care even in the most resource-limited environments.

Consent for Publication:

Written informed consent was obtained from the patient for the publication of this case report and their accompanying images.

Competing Interests: The authors declare that they have no competing interests.

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Author's Contribution:

SS, ZM and MB participated in the clinical management of the patient and MDT discussion.

SS prepared and wrote the manuscript.

RM (EKDA) proofread the manuscript.

All authors read and approved the final manuscript.

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