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Case Report

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Unexpected Uterine Enlargement During Laparoscopic Hernia Repair: A Case Report Emphasizing the Role of Artificial Intelligence in Modern Surgical Decision-Making

Israel A Posner

Medicine, R, Anesthesiologist, Pain Management Specialist Founder, Oranjestad, Aruba, Aruba

Corresponding author
Israel A Posner, Medicine, R, Anesthesiologist, Pain Management Specialist Founder, Oranjestad, Aruba, Aruba.

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ABSTRACT
This case report details an unexpected intraoperative finding of uterine enlargement during laparoscopic repair of a scar hernia in a woman in her thirties. The operation was aborted due to diagnostic uncertainty regarding possible pregnancy. However, a postoperative β-hCG test was negative. This case highlights the critical role of Artificial Intelligence (AI) in aiding diagnosis and decision-making, avoiding complications, and enhancing clinical outcomes. As medicine evolves, clinicians who fail to integrate AI into practice may fall behind in diagnostic accuracy and patient safety.

Introduction

Minimally invasive surgery has transformed abdominal procedures, improved recovery and reducing complication rates. However, intraoperative surprises, such as unexpected organomegaly, can present diagnostic dilemmas. In this case, the use of real-time ultrasonography and laparoscopic imaging, paired with AI-assisted decision support, played a pivotal role in the clinical pathway.

Case Presentation

A 30-something-year-old female presented with a symptomatic incisional hernia, scheduled for elective laparoscopic scar hernia repair. She had no significant comorbidities and her menstrual history was reportedly irregular. No preoperative imaging indicated abnormalities beyond the hernia.

During the laparoscopic procedure, the surgical team noted a markedly enlarged uterus occupying much of the pelvic cavity, as visualized on the laparoscopic monitor (Figures 4 and 5). The uterus appeared firm, round, and significantly enlarged, raising concern for undiagnosed pregnancy or uterine pathology (e.g., fibroids, adenomyosis). Out of caution, the procedure was **aborted**.

Postoperative Evaluation

A rapid serum β-hCG test was immediately performed and returned negative, ruling out pregnancy. Transabdominal ultrasound (Figures 1-3) corroborated the finding of an enlarged uterus with heterogeneous myometrial echotexture, suggesting possible fibroid disease.

Imaging Findings

- **Figures 1-3 (Ultrasound):** The uterus is visualized as a midline pelvic structure with enlarged dimensions and a heterogeneous echotexture consistent with a myomatous uterus. No intrauterine gestational sac was noted. The anterior abdominal wall hernia was visible inferiorly, with displacement of bowel loops.

- **Figures 4-5 (Laparoscopy):** A large, dome-shaped uterus with prominent vascular markings is seen occupying the lower abdomen. No adhesions or other pathology were observed.

Discussion

This case underlines the challenges surgeons face when encountering unexpected pathology intraoperatively. In the absence of definitive intraoperative imaging or laboratory

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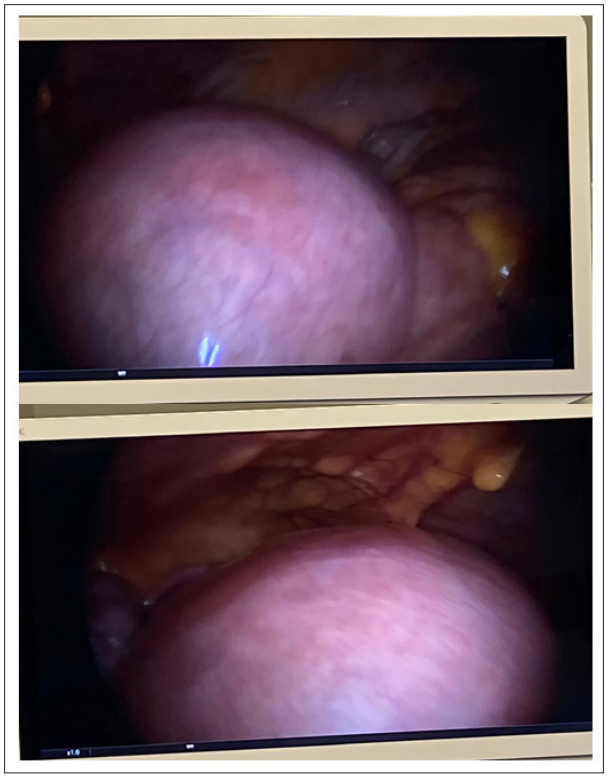
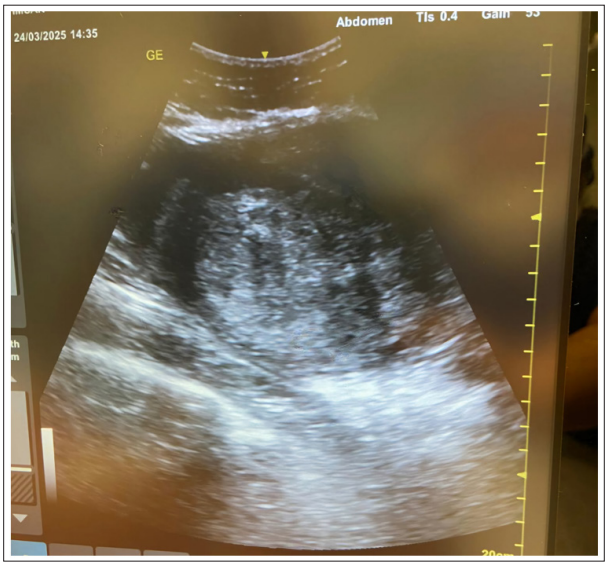
confirmation, the prudent choice was to abort the procedure to avoid iatrogenic harm.





Artificial Intelligence (AI) in Surgical Decision Support:
AI tools such as **image recognition algorithms** and **real-time diagnostic decision support systems** can aid significantly in such scenarios. For example:

- AI-enhanced ultrasound interpretation could have flagged abnormal uterine size or suspected fibroids preoperatively [1].
- AI-driven intraoperative imaging platforms, like those being developed for laparoscopic navigation, can support anatomical recognition and pathology differentiation in real time [2].
- Natural language AI tools could provide surgical teams with rapid literature support during unexpected findings [3].

In low-resource settings or centers without immediate access to subspecialists (radiologists, gynecologists), AI becomes even more vital to ensure safe and informed decision-making.

Conclusion

This case exemplifies the increasing necessity of incorporating AI into clinical workflows. From preoperative planning to intraoperative guidance and postoperative diagnostics, AI can be a powerful ally in enhancing surgical precision and safety. Clinicians who do not adapt risk delivering outdated care, potentially compromising outcomes.

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