International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Shukla S. Int J Reprod Contracept Obstet Gynecol. 2026 May;15(5):1854-1857
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20261302

Case Report

Delayed vesicovaginal fistula after abdominal hysterectomy attributed to oxidized regenerated cellulose: a case report

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Received: 02 March 2026
Revised: 03 April 2026
Accepted: 04 April 2026

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ABSTRACT

Vesicovaginal fistula (VVF) is a distressing complication following hysterectomy. While most cases result from direct surgical trauma or tissue devascularization, delayed fistula formation secondary to foreign body reaction is uncommon. Oxidized regenerated cellulose, widely used as a topical haemostatic agent, has occasionally been associated with inflammatory complications when placed adjacent to hollow organs. A 45-year-old woman without comorbid illness underwent total abdominal hysterectomy for symptomatic adenomyosis. Intraoperative dye testing confirmed bladder integrity. Minor vault bleeding was controlled using oxidized regenerated cellulose. Thirteen days postoperatively, she developed intermittent urinary leakage per vagina, noticeable when the bladder was distended. Retrograde dye testing demonstrated a small vesicovaginal fistula. Magnetic resonance urography confirmed contrast passage into the vagina. Computed tomography revealed multiloculated cystic lesions along the superior bladder wall, suggestive of inflammatory reaction to retained haemostatic material. Initial management included continuous bladder drainage, followed by definitive surgical repair after three months, resulting in complete recovery. Delayed VVF related to oxidized regenerated cellulose is rare but preventable condition. Careful placement of absorbable haemostatic materials near hollow viscera and early recognition of postoperative urinary leakage are essential to reduce morbidity associated with it.

Keywords: Vesicovaginal fistula, Oxidized regenerated cellulose, Hysterectomy, Foreign body reaction, Postoperative complication

INTRODUCTION

Vesicovaginal fistula represents an epithelialized tract between the urinary bladder and vagina, leading to involuntary urinary leakage. In high-resource healthcare settings, most cases occur as unintended consequences of pelvic surgery, particularly hysterectomy. The incidence following hysterectomy has been reported to range between 0.1% and 0.2%.[1] Common etiologies include inadvertent bladder injury, excessive electrocautery, compromised vascular supply, infection, or progressive tissue necrosis. Less frequently, inflammatory reactions to surgical materials may contribute to delayed tissue breakdown and fistula formation.

Oxidized regenerated cellulose is an absorbable topical haemostatic agent commonly used to control diffuse oozing. Although generally considered safe, its placement near hollow organs has been associated with exaggerated inflammatory responses, granuloma formation, and erosion into adjacent structures.[2,3] We report a rare case of delayed vesicovaginal fistula following abdominal hysterectomy attributed to oxidized regenerated cellulose.

CASE REPORT

A 45-year-old P2L2A2 woman presented with chronic heavy menstrual bleeding unresponsive to medical therapy. She had no history of diabetes, hypertension, or other systemic illness. Clinical and imaging findings were consistent with adenomyosis, and total abdominal hysterectomy with bilateral salpingectomy was performed. Intraoperatively, the uterus was smoothly enlarged and globular. Bilateral adnexa were normal. The hysterectomy was completed without any complications. There was no excessive blood loss, blind suturing, or excessive cautery use.

Bladder integrity was assessed using intraoperative methylene blue dye testing, which showed no leakage. Minor vault oozing was controlled using two small pieces of oxidized regenerated cellulose. The abdomen was closed in layers. Final histopathological examination confirmed adenomyosis. The immediate postoperative period was uneventful, and the patient was discharged on postoperative day five. On postoperative day thirteen, she reported intermittent passage of urine per vagina, particularly when the bladder was full. There was no associated fever or abdominal pain. A retrograde dye test was performed by instilling methylene blue into the bladder while placing vaginal swabs. Staining of the uppermost swab confirmed a small vesicovaginal communication. Ultrasonography in the immediate post-operative period was normal and there were no adnexal masses or pelvic collections (Figure 1).

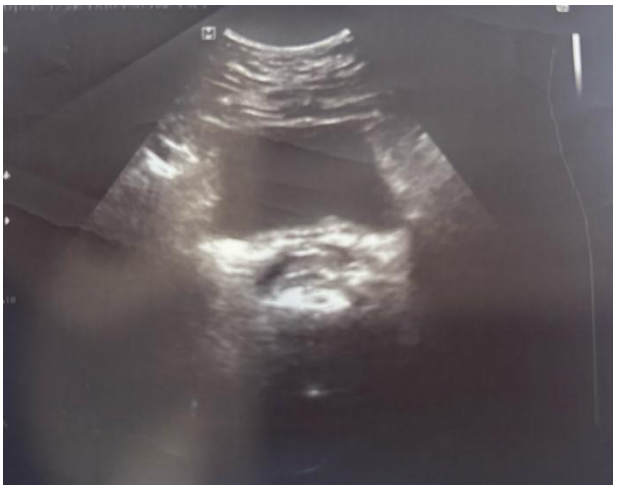

Figure 1: Pelvic ultrasonography showing a well-distended urinary bladder with no evidence of pelvic collection or adnexal mass in the immediate postoperative period.

CT urography demonstrated the normal opacification of both ureters with contrast passage into the vaginal cavity, consistent with a small vesicovaginal fistula (Figure 2). On CT urography multiloculated irregular cystic lesions were noted along the superior bladder wall bilaterally, measuring approximately 2.8×4.0×2.8 cm on the right side and 3.6×5.6×4.0 cm on the left side (Figure 3). CT urography revealed a small linear contrast-filled tract of ~7mm extending from the urinary bladder to the vaginal vault (Figure 4).

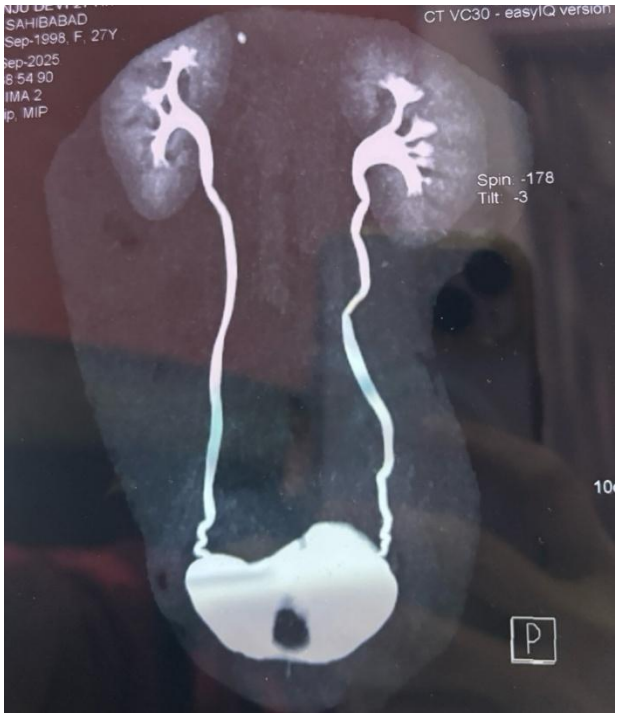

Figure 2: Coronal CT urography demonstrating contrast opacification of bilateral pelvicalyceal systems and ureters with filling of the urinary bladder with contrast leakage into the vaginal cavity.

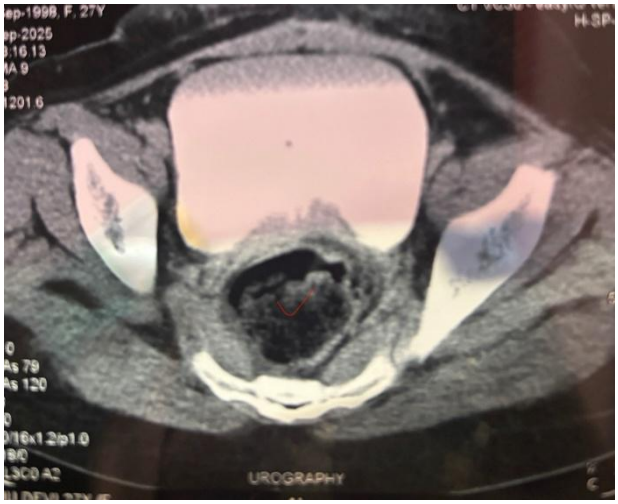

Figure 3: Axial CT urography image showing a small contrast-filled outpouching/linear tract arising from the posterior wall of the urinary bladder (arrow), suggestive of vesicovaginal fistula.

The uterus was not visualised post-hysterectomy. No adnexal masses were identified on preoperative ultrasonography or intraoperatively. In view of the negative intraoperative dye test, delayed onset of

symptoms, and imaging findings adjacent to the vaginal vault where oxidized regenerated cellulose had been placed, the fistula was attributed to a foreign body inflammatory reaction resulting in localized bladder wall erosion.

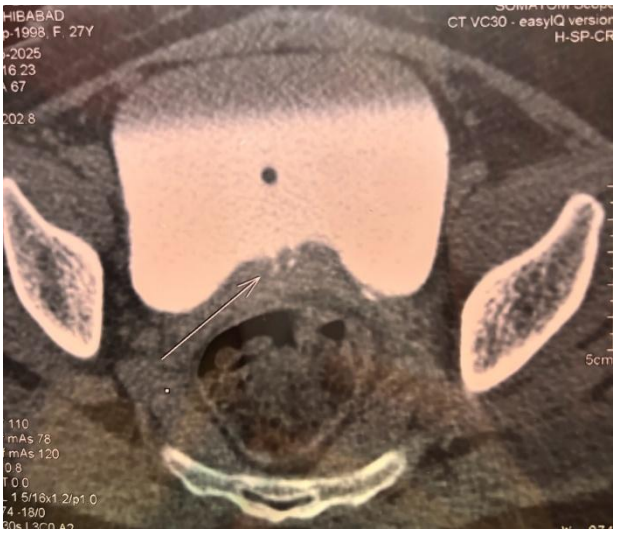

Figure 4: Axial CT image demonstrating multiloculated cystic lesions adjacent to the superior aspect of the urinary bladder, consistent with inflammatory reaction likely related to retained haemostatic material.

Initial management consisted of continuous bladder drainage using a Foley catheter to allow inflammation to subside. Definitive vesicovaginal fistula repair was performed after three months. Postoperative recovery was satisfactory, and the patient achieved complete continence. She remains asymptomatic on follow-up.

DISCUSSION

Vesicovaginal fistula remains one of the most distressing complications of gynaecologic surgery. Although multiple etiologies have been described, several reports have documented erosion of oxidized regenerated cellulose into adjacent hollow organs, including the bowel and urinary tract, resulting in obstruction, perforation, or fistula formation.[4] In developed healthcare settings, hysterectomy accounts for the majority of iatrogenic cases. The reported incidence ranges between 0.1% and 0.2%, most commonly due to unrecognized intraoperative bladder injury, excessive electrocautery, devascularization, infection, or postoperative tissue necrosis.[5,6]

In the present case, several factors argue against direct surgical injury. The procedure was uncomplicated, no blind suturing or excessive cautery was used, intraoperative bladder integrity testing was negative, and the patient remained asymptomatic in the immediate postoperative period. The delayed onset of urinary leakage on postoperative day thirteen suggests a secondary mechanism of bladder wall erosion rather than primary trauma. Oxidized regenerated cellulose is widely used for haemostasis because of its absorbable nature and acidic environment, which promotes clot stabilization.[1] However, inflammatory pseudotumor formation and erosion into adjacent organs due to retained oxidized regenerated cellulose have been reported. Histologically, foreign body reactions may involve macrophage infiltration, multinucleated giant cells, and fibrosis, which may persist for several weeks before absorption.[3]

Radiologically, retained oxidized regenerated cellulose may mimic abscesses, hematomas, lymphadenopathy, or even malignancy on CT and MRI.[2] The multiloculated cystic lesions abutting the superior bladder wall in our patient correlate with previously described imaging appearances. Additional reports describing complications related to oxidized regenerated cellulose further support its potential to produce mass-like lesions and diagnostic confusion.[7,8] Delayed presentation of vesicovaginal fistula between 7 and 21 days postoperatively has been described and is typically attributed to progressive tissue necrosis rather than immediate surgical injury.[9] Conservative bladder drainage may be attempted in selected small fistulas; however, delayed surgical repair after resolution of inflammation remains the standard approach for optimal outcomes.[5-10] In this case, delayed repair resulted in complete resolution of symptoms. This case highlights the importance of cautious use of absorbable haemostatic agents near hollow viscera and the need for early recognition of postoperative urinary leakage to reduce morbidity.

CONCLUSION

Delayed vesicovaginal fistula secondary to oxidized regenerated cellulose is an uncommon but avoidable complication. Surgeons should exercise caution when placing topical haemostatic materials in proximity to the urinary bladder. Early evaluation of postoperative urinary leakage facilitates timely diagnosis and appropriate management.

ACKNOWLEDGEMENTS

The author acknowledges the Department of Radiology and Urology for their assistance in patient management.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Shukla S. Delayed vesicovaginal fistula after abdominal hysterectomy attributed to oxidized regenerated cellulose: a case report. Int J Reprod Contracept Obstet Gynecol 2026;15:1854-7.