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Case Report

Postoperative management and surgical decision-making in scleroderma: insights from a case study

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ABSTRACT

Scleroderma, a chronic autoimmune disease characterized by diffuse fibrosis, poses significant challenges for wound healing and postoperative recovery. The fibrotic changes and altered collagen production associated with scleroderma can complicate surgical outcomes, including wound healing and adhesion formation. This case report highlights the unique challenges faced in the surgical management of scleroderma patients, focusing on the postoperative appearance of the stoma, the risk of inflammatory adhesions and the implications of laparoscopic surgery in these patients. A 55 years old female with diffuse scleroderma, complicated by contractures, acro-osteolysis and multiple other systemic issues, presented with abdominal pain and a perforated sigmoid colon caused by an ingested foreign body. She underwent a laparoscopic Hartmann's procedure. Postoperatively, the stoma appeared necrotic on day 2, though it was functionally healthy. Subsequent complications included small bowel obstruction and adhesions, necessitating additional surgical interventions. Scleroderma affects wound healing due to fibrotic changes and impaired collagen deposition. In this case, the necrotic appearance of the stoma was likely due to inflammatory changes rather than true necrosis. Laparoscopic surgery, while beneficial in reducing tissue trauma and complications, still presents risks in scleroderma patients, including adhesion formation. Early-stage scleroderma patients may experience fewer fibrotic changes but are still at risk for postoperative complications. Scleroderma patients require careful management to mitigate surgical complications. Laparoscopic approaches can reduce trauma and recovery time but do not eliminate the risk of adhesions and other complications. Ongoing monitoring and tailored postoperative care are essential for optimizing outcomes in these patients.

Keywords: Adhesion formation, Laparoscopic surgery, Postoperative care, Scleroderma, Wound healing

INTRODUCTION

Scleroderma is a chronic autoimmune disease characterized by fibrotic changes in the skin and systemic organs. It involves complex pathophysiology, leading to chronic fibrosis with inflammatory infiltrates and endothelial damage. This results in the release of autoantibodies, cytokines and chemokines, which promote the deposition of firm connective tissue.[1]

CASE REPORT

A 55 years old female presented with generalized abdominal pain for 10 days, without any history of swallowing or inserting a foreign body. Her medical history included diffuse scleroderma complicated by contractures, acro-osteolysis, osteomyelitis of the right thumb, ventricular and supraventricular tachycardia, left ischial tuberosity dystrophic calcification and osteoporosis (Figures 1-3).

On admission, a CT scan of the abdomen revealed a 43×4 mm cylindrical foreign body lodged in the sigmoid colon, which appeared to have perforated the colon at both anterior and posterior aspects (Figure 4). Adjacent gas suggested extraluminal presence. The origin of the foreign body was unclear, but it was suspected to be a displaced stent or ingested object. The following day, she

underwent a laparoscopic Hartmann's procedure due to sigmoid perforation caused by a 10 cm chicken bone. Intra-operatively, a perforated sigmoid colon with a walled-off abscess cavity between the sigmoid colon and uterus, multiple pelvic adhesions and purulent fluid in the pelvis were found (Figure 5 and 6).

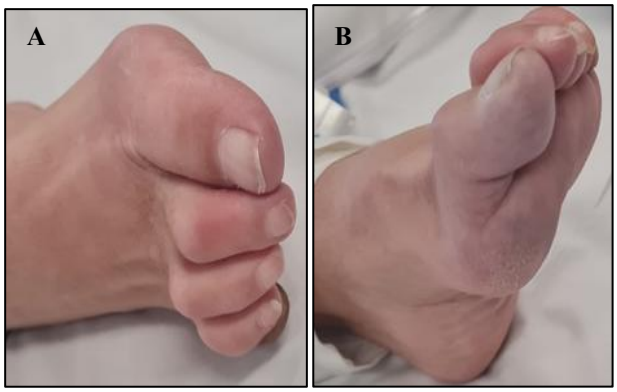

Figure 1 (A and B): Sclerodactyly of right and left great toes.

Figure 2: sclerodactyly and infection.

Figure 3: Sclerodactyly.

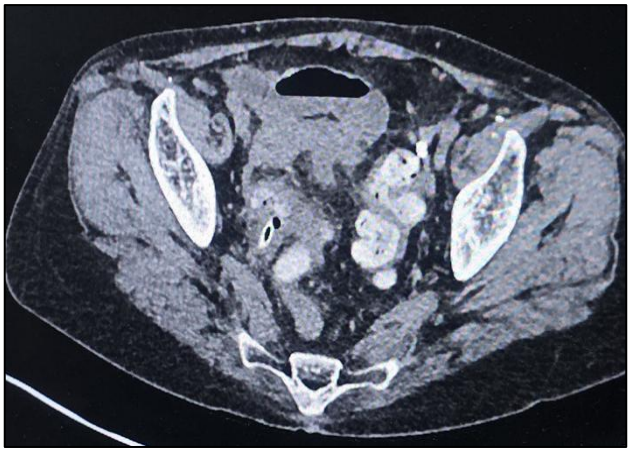

Figure 4: CT scan of sigmoid perforation with a arrow pointing at the foreign body.

Figure 5: Chicken bone causing bowel perforation.

Figure 6: Resected sigmoid bowel containing perforation.

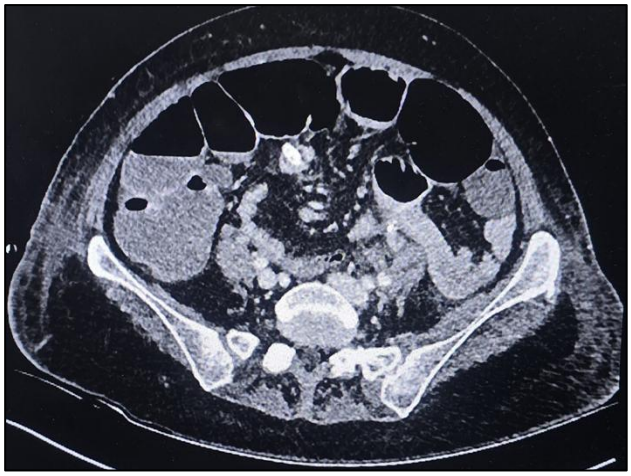

Figure 7: CT scan figure of post-operative bowel obstruction with a arrow pointing at a transition point in left iliac fossa on Day 11.

Figure 8: Necrotic stoma on post-operative day 2.

On postoperative day 2, her stoma externally appeared necrotic (Figure 7) and a colonoscopy was performed, on which the rest of the mucosa appeared normal. On postoperative day 11, a follow-up CT scan showed small bowel obstruction with a transition point in the left iliac fossa but no intra-abdominal collection (Figure 8). On day 12, she underwent a diagnostic laparoscopy, which was converted to a minimal lower midline laparotomy with adhesiolysis and appendicectomy.

Inflammatory adhesions were found in the pelvis, along with a long segment of small bowel transition point and a dilated tip of the appendix. Due to the stoma being non-active, a progress CT was done on day 18, which showed no evidence of mechanical intestinal obstruction. The nasogastric tube was removed on day 19 and she was commenced on free fluids on day 21. Her stoma began functioning on postoperative day 21 and her diet was upgraded to soft on day 22. Her inflammatory markers gradually decreased and she was regularly reviewed by a physiotherapist post-operatively for mobility and was discharged home on day 24.

DISCUSSION

Systemic sclerosis (scleroderma) is a chronic autoimmune disease characterized by widespread fibrosis affecting the skin, internal organs and connective tissues. The disease is known for its impact on wound healing due to the excessive deposition of collagen and other fibrotic changes. This can complicate postoperative outcomes, especially in the context of surgical procedures.

Fibrosis and wound healing in scleroderma

Scleroderma involves the progressive accumulation of collagen and other extracellular matrix components, leading to tissue fibrosis. This fibrotic process is driven by transforming growth factor-beta (TGF-β), which promotes collagen production and contributes to the thickening and scarring of tissues. TGF-β1 is particularly associated with fibrosis, while TGF-β3 may aid in reducing scarring in wound healing.[1-3] The altered collagen deposition and immune response in scleroderma patients can impair normal wound healing, making these patients more susceptible to complications such as delayed healing and adhesion formation.

Surgical considerations

The choice of surgical approach in scleroderma patients whether laparoscopic or open surgery can significantly affect postoperative outcomes. Laparoscopic surgery is often preferred due to its benefits, including smaller incisions, reduced tissue trauma and shorter recovery times. These advantages are particularly relevant in scleroderma patients, where minimizing surgical trauma can reduce the risk of postoperative complications such as adhesions.[4,5]

In the presented case, the patient underwent a laparoscopic Hartmann's procedure, which, despite being less invasive, still carried a risk of early inflammatory adhesions. In scleroderma patients, even minimally invasive techniques can result in adhesion formation due to the underlying fibrotic and inflammatory processes. Early postoperative inflammatory changes can sometimes mimic the appearance of necrosis. The stoma in this patient appeared necrotic on postoperative day 2, likely due to inflammatory edema and tissue changes rather than true necrosis. This underscores the importance of distinguishing between inflammation-induced changes and actual tissue necrosis in the postoperative assessment.[6,7]

Adhesion formation and management

Adhesions are a common postoperative complication in scleroderma patients due to their predisposition to fibrosis. Early-stage disease may present with less extensive fibrosis, but the risk of adhesions remains significant due to ongoing inflammation. Although

laparoscopic surgery is associated with a lower incidence of adhesions compared to open surgery, scleroderma patients still require vigilant postoperative monitoring. Strategies to minimize adhesion formation include careful surgical technique, the use of adhesion barriers and thorough postoperative care.[8,9]

Clinical implications

The management of scleroderma patients undergoing surgical procedures requires a nuanced approach. Surgeons should consider the patient's disease stage, the extent of fibrosis and the potential for postoperative complications when planning the surgical approach. Minimally invasive techniques like laparoscopy are advantageous but do not entirely eliminate the risk of complications. Postoperative care must be tailored to address the specific risks associated with scleroderma, including close monitoring for signs of adhesion formation and inflammation.

CONCLUSION

Scleroderma presents unique challenges in surgical settings due to its impact on wound healing and the increased risk of adhesions. The choice of surgical approach laparoscopic or open should be made with careful consideration of the patient's overall condition and disease stage. Laparoscopic surgery offers benefits in reducing tissue trauma and recovery time but does not entirely negate the risk of postoperative complications, including early inflammatory adhesions.

The appearance of necrosis in the stoma in this case highlights the importance of distinguishing between inflammatory changes and true necrosis in postoperative evaluation. Surgeons must adopt strategies to minimize adhesion formation and manage postoperative complications effectively. Close postoperative monitoring, along with meticulous surgical techniques, are essential to optimizing outcomes in scleroderma patients.

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