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Case Report

Leakage of ruptured silicone breast implants through abdominal laparoscopic port sites: A rare complication following transabdominoplasty breast augmentation

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ABSTRACT

Background: Abdominoplasty and breast augmentation are two of the most commonly performed aesthetic procedures in the UK. When performed as a combined procedure, separate inframammary and abdominoplasty incisions are most frequently used. Transabdominoplasty breast augmentation, performed via a single abdominoplasty incision is also described.

Case: A 69-year-old female, having undergone a transabdominoplasty breast augmentation 20 years previously, was diagnosed with ascending colon cancer and admitted for a laparoscopic-assisted, right hemi-colectomy. Despite all the port sites being abdominal and below the inframammary fold, on their removal, silicone from ruptured breast implants was leaking through the port sites.

Outcome: The patient subsequently underwent an uneventful explantation of bilateral, ruptured, subglandular implants and recovered well.

Learning points: We recommend that breast implant explantation should be considered when patients indicated for elective

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intra-abdominal surgery are noted to have ruptured breast implants on staging CT imaging, especially when inserted via an abdominoplasty approach.

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Background

Abdominoplasty and breast augmentation are two of the most commonly performed aesthetic procedures in the UK and it is not uncommon for them to be performed concurrently. The benefits of a combined procedure include reduced cost, patient convenience and a single recovery period. When performed as a combined procedure, separate breast augmentation and abdominoplasty incisions are most frequently used. Various techniques for breast augmentation have been described, and the most commonly performed approach is the inframammary approach, although other approaches are also performed, including periareolar, transaxillary and transumbilical.¹ Although not common practice, single-incision breast augmentation, performed through the abdominoplasty incision, has been described previously.^{2,3} The most common complications of breast augmentation, via any approach, include capsular contracture, infection, haematoma formation or rupture of implants.¹ Transabdominoplasty breast augmentation, has been reported in the literature to have complication rates similar to those reported for the individual procedures, and so a single-incision approach may seem favourable to patients.⁴

Colorectal cancer is the third most common cancer worldwide and the one of the largest causes of cancer-related deaths.⁵ The mainstay of treatment is resection bowel surgery, followed by chemotherapy or radiotherapy in suitable patients. The bowel resection is performed increasingly, via laparoscopic-assisted surgery. Insertion of port sites in abdominal surgery carries known risks of bleeding, intestinal perforation, vascular injury, intraperitoneal adhesions and subcutaneous emphysema.⁵

We present the first report of a rare complication of the rupture of breast implants with subsequent leakage of silicone, through laparoscopic port sites during colorectal surgery.

Case presentation

A 69-year-old female with a history of bilateral breast augmentation and abdominoplasty, body mass index 39, hypertension and arthritis, was diagnosed with screen-detected, ascending colon cancer and admitted for a laparoscopic-assisted right hemi-colectomy. The preoperative CT scan showed bilateral intracapsular rupture of breast implants with the left implant having a much smaller volume than the right. The left implant was located in a lower position on the chest wall; however, no silicone was detected in the anterior abdominal wall on this CT (Figure 1). Her breast augmentation had been performed 20 years previously via an abdominoplasty incision and she had sought explantation since, but had been advised against this by her surgeon. The cancer resection operation proceeded uneventfully until removal of the 5 mm laparoscopic abdominal ports, wherein it was noted that silicone was leaking from the epigastric and left lower quadrant port sites, but not from the midline or suprapubic incisions.

On discovery of the leakage of silicone, the general surgeons contacted the on-call plastic surgery consultant for advice. Being a regional plastic surgery centre, the referring team was not present in the same hospital, and therefore the general surgeons were advised to temporise the situation until the patient could be transferred to our care. They were advised to express as much silicone as possible out of the two affected port sites and to close the port sites internally with sutures, to reduce



Figure 1. A preoperative CT scan showing intracapsular rupture of both implants. The left implant has a smaller volume and is sitting in a lower position on the chest wall.

silicone leakage into the abdominal cavity. They left the skin open externally to drain, with wound management dressings to allow ongoing discharge, and the patient was placed on a protracted course of antibiotics. Immediately post-operatively, the patient was informed of the unexpected complication, as per the duty of candour, and that it was likely that her ruptured implants had leaked and tracked down her abdominal wall, forming a silicone pocket and that the port sites thereby punctured it intraoperatively. The patient was transferred to the care of plastic surgery shortly afterwards once she was out of the immediate postoperative window.

Her post-operative recovery was significant only for ongoing silicone discharge from the epigastric port site. A postoperative CT scan showed bilateral extracapsular implant rupture, with deflation of the left implant and tracking of silicone to the area of the epigastric port site wound in the upper anterior abdominal wall (Figures 2 & 3). The patient subsequently underwent an uneventful explantation of bilateral, subglandular implants under the care of our team. Intraoperatively, it was noted that there was a communication of the left implant cavity with the epigastric incision, thus explaining the ongoing leakage of silicone through her wound.

Follow-UP

The patient's pathology was confirmed as a T3 N0 Duke's B right colonic adenocarcinoma, for which she was offered and subsequently declined adjuvant chemotherapy. Her port sites had all healed well following her implant explantation and she was discharged to six monthly clinic appointments, annual CT scans and a further colonoscopy. At follow-up in the plastic surgery clinic, the incisions had healed well, she maintained good symmetry in a bra and both breasts were soft and non-tender. Two years postoperatively, she had not experienced any further wound problems or intra-abdominal complications such as silicone granuloma formation. She was subsequently discharged, back to the care of her GP.



Figure 2. A postoperative CT scan showing bilateral extracapsular implant rupture, with deflation of the left-sided implant and tracking of silicone to the area of the epigastric port site wound.

Discussion

The inframammary approach is often regarded as the most straightforward approach for breast augmentation.¹ It provides a scar that is hidden in the inframammary fold while permitting unparalleled visualisation of the breast pocket, allowing access to both the subglandular and subpectoral planes.¹

Transabdominal placement of breast implants, although much less common than the inframammary approach, is well recognised in the literature and was first described in 1976.^{2,3} Cohen et al. published a case series of 150 patients who underwent subpectoral breast augmentation, with silicone or saline implants.² All patients underwent a lower transverse incision as well as a periumbilical incision, and the abdominal skin and fat were elevated off the rectus sheaths bilaterally, up to the costal margin. Following this, 3–4 cm tunnels were created, up to the visualisation of pectoralis muscle fibres, and incisions were made into the subpectoral plane. The implant pockets were bluntly dissected and the implants were placed. Closure of the tunnels was performed for 80 patients and in 70 patients, the tunnels were left open to drain.² The authors advocate for transabdominoplasty breast augmentation and report low short-term complication rates, with 0% capsular contracture over 18–24 months.²

Dini et al., in a prospective series of 100 patients, described a similar approach to transabdominoplasty breast augmentation, but notably closed all tunnels, using an absorbable polyglactin 2.0 suture, to affix the aponeurosis to the subcutaneous tissue, in order to reconstruct the patient's mammary fold.³ This approach had previously been highlighted by the same group as being a critical technical step for the prevention of seroma formation and one that can have a poor outcome when performed by inexperienced surgeons.³ The follow-up period averaged at 36 months, and they reported no contracture but noted an association between complications and the number of sutures used to close the tunnel dead space; i.e. the less sutures used the more the complications.³

Although records pertaining to our patient's prior procedure were unavailable, it appears that her breast augmentation had been performed through an abdominoplasty incision, in a combined proce-

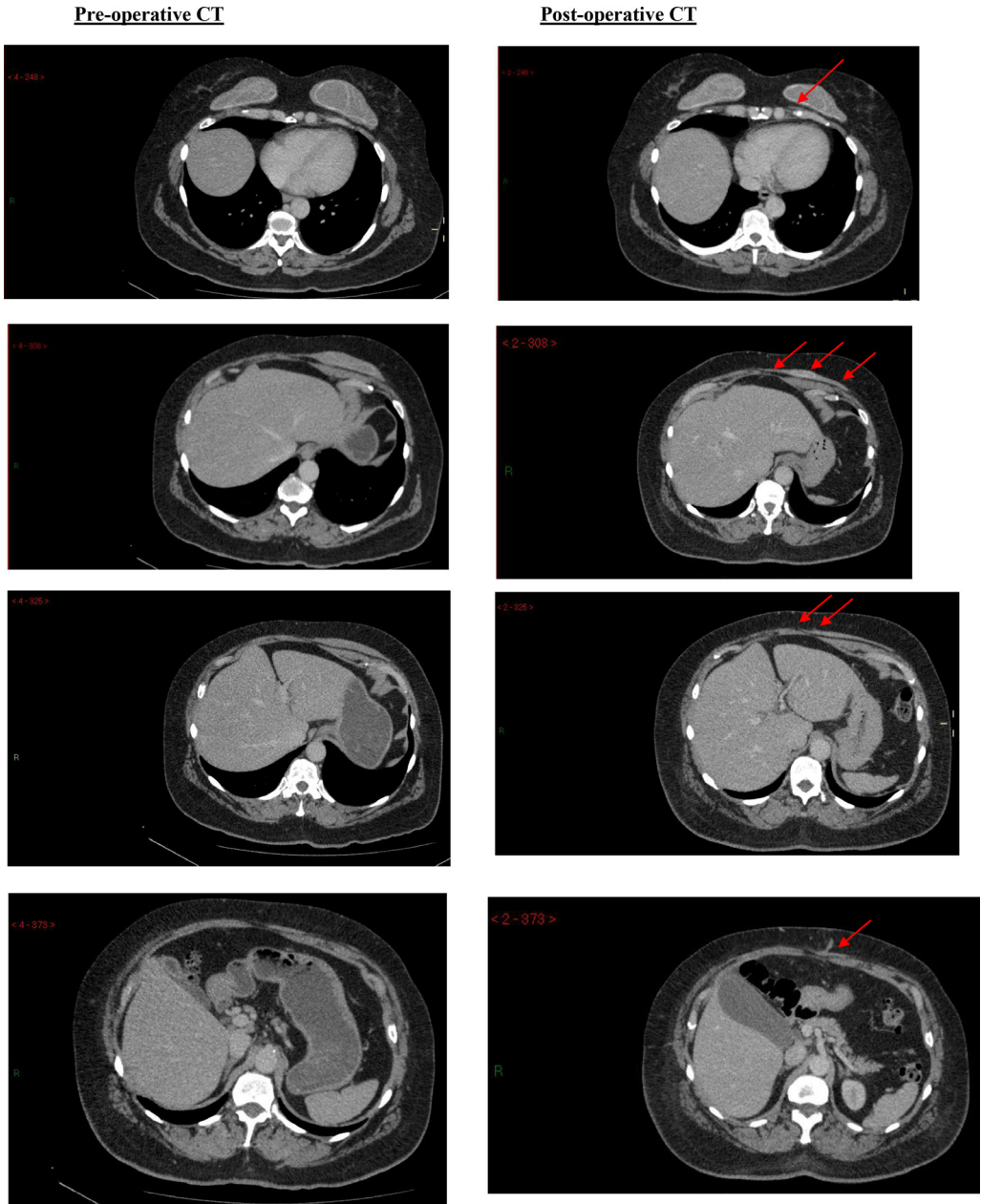


Figure 3. Pre and postoperative CT sequences showing the silicone migration. Red arrows highlight silicone tracking.

ture using a technique similar to that described previously.^{2,3} The cavity thereby created underneath her abdominal apron was subsequently punctured during her colorectal operative procedure. This allowed the leakage of silicone gel from her ruptured implants to exit via the laparoscopic port sites.³

Silicone has long been associated with autoimmune conditions and granulomatous reactions in patients with silicone breast implants; however, there remains little consensus on any causal rela-

tionship. Furthermore, late complications such as local silicone granulomas in the breast and regional lymphadenopathy from silicone implant failure have been described.^{6,7} Silicone deposition has been shown to stimulate a foreign body inflammatory reaction within the tissues, and reports document the accumulation of silicone in many organs, including the lungs and liver, in patients with and without silicone implant rupture.^{7,8} Migration of silicone is, however, not fully understood but is believed to occur via lymphatics, through direct trauma or, in very rare cases, through inadvertent surgical spread. Migration of silicone from the chest wall to other body sites is rare, with a 2018 review finding only 20 cases in the literature of which the majority showed silicone granuloma formation within the upper limb or thorax, with only three documented abdominal silicone granulomas.⁹ One case report of intrathoracic spread documented a phenomenon called “silicone thorax”, wherein a patient presented with pulmonary nodules, which proved to be biopsy-confirmed siliconoma.⁸ Her history was significant for asymptomatic silicone breast implant rupture, noted during subsequent cardiac surgery, and the authors propose inadvertent introduction of silicone into the thoracic cavity, during this surgery, as the pathophysiology for her presentation.⁸ As with the subsequent colorectal surgery in our case, the patient is at risk of inadvertent introduction of silicone into the abdominal cavity, despite best efforts to minimise this by the operating colorectal team. One abdominal case report documented a patient presenting with a left upper quadrant abdominal mass and a sternal mass, due to migration of silicone from a ruptured breast implant, forming distant silicone granulomas.¹⁰ CT scans were used as the imaging modality of choice for readily available initial assessment in this case report, and identified asymptomatic implant rupture and demonstrated the plane of herniation of the implant within the abdominal wall.¹⁰ The authors acknowledged the increased sensitivity and specificity of magnetic resonance imaging (MRI) for breast implant rupture; however, they commented on the comparative cost-effectiveness and wider accessibility of CT imaging, which in this case was adequate.¹⁰

One major limitation in the current literature is that it is not known what the risk of silicone granuloma formation is for patients with either symptomatic or asymptomatic implant failure, and the consensus is that this complication usually presents many years after implantation. Furthermore, cases have been documented showing no detectable silicone in the liver 14 months after the removal of the ruptured silicone implants, with the authors proposing bile excretion or degradation to silica and silicone complexes, allowing resolution within the tissues.⁷ In addition, there is at present no consensus in the literature regarding long-term follow-up for these patients or discussion regarding whether further imaging to look for possible silicone granuloma development is beneficial. Our patient was followed up after both plastic surgery and colorectal surgery and, at 2 years postoperatively, neither did she develop further silicone complications nor were any siliconomas detected on her subsequent annual CT scans. Given the lack of consensus in the literature for serial MRI/CT to prophylactically look for asymptomatic siliconoma formation, and the rarity of its development, we did not further image the patient specifically for this indication.

This is the first report on this exceptionally rare complication. Despite favourable literature reporting on the comparable or reduced complication rates for this combined transabdominoplasty approach, no follow-up period accounted for longer-term complications or the need for future abdominal surgery. Importantly, the literature lacks sufficient evidence of a standardised technique, and in the small case series reported, authors vary in their decision as to, and in fact how to, reconstruct and repair the tunnels of varying dimensions that were used to place the implants. However, in light of this described complication, closure of these tunnels may be preferable. In addition, in cases where ruptured breast implants are noted incidentally on staging CT imaging, we would advocate for prompt referral to a plastic or breast surgeon for consideration of removal, to prevent the potential long-term sequelae of silicone migration, extravasation, lymphadenopathy and siliconoma formation.

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None.

Conflict of Interest

None declared.

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Ethical approval

Not required

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