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Breast implant extrusion caused by polymicrobial infection (ESBL *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*) in a patient with Crohn's disease: A case report

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Abstract
Breast implant extrusion is a rare but serious complication following cosmetic or reconstructive breast surgery. It is usually associated with infection, tissue necrosis, and wound tension. Systemic inflammatory diseases, such as Crohn's disease, increase the risk of poor wound healing and postoperative infection. This report describes a case of a 38-year-old woman from Puerto Rico with a history of Crohn's disease who underwent bilateral breast augmentation with mastopexy in Bogotá, Colombia. The initial postoperative period was uneventful; at two weeks, the skin was intact with no implant exposure. The patient returned to Puerto Rico, where she subsequently developed wound drainage. A culture revealed *Pseudomonas aeruginosa* sensitive to all antipseudomonal antibiotics tested. Upon returning to Colombia, she presented with complete extrusion of the left breast implant, with necrotic margins and purulent exudate. A new culture revealed coinfection with extended-spectrum beta-lactamase (ESBL)-producing *Klebsiella pneumoniae* and *Pseudomonas aeruginosa*. The implant was removed on postoperative day 66, and the wound was temporarily covered with sterile dressings. The patient completed a 14-day course of intravenous meropenem, followed by local wound care. One month later, during the surgical evaluation for breast reconstruction, it was determined that a new implant could not be placed due to insufficient soft tissue coverage. Therefore, reconstruction with a local flap advancement was planned. It was concluded that the combination of extensive soft tissue loss, polymicrobial infection, and underlying Crohn's disease contraindicates immediate reimplantation. Complete explantation, along with targeted antibiotic therapy and delayed reconstruction, constitutes the safest strategy to minimize recurrence and achieve optimal long-term aesthetic results.

Keywords: Prosthesis-related infections, drug resistance, Crohn disease, soft tissue reconstruction, plastic surgery, case report

Introduction
Breast implant extrusion represents one of the most severe complications following aesthetic or reconstructive breast surgery. Although uncommon, with an estimated incidence ranging from 0.2% to 2.5%, depending on indication and patient population, it carries significant aesthetic, psychological, and infectious consequences for the patient [1-3]. This condition is characterized by partial or complete exposure of the prosthesis through the overlying soft tissue envelope, most commonly secondary to infection, tissue necrosis, or excessive mechanical tension at the incision site [4, 5].

The underlying pathophysiology involves a role between local tissue ischemia, bacterial colonization, and the development of bacterial biofilms on the implant surface [6,7]. *Staphylococcus aureus*, *Staphylococcus epidermidis*, and *Pseudomonas aeruginosa* are among the most frequently isolated pathogens in periprosthetic infections, while the emergence of extended-spectrum β-lactamase (ESBL)-producing Enterobacteriaceae, such as *Klebsiella pneumoniae*, has further complicated treatment in recent years [8-10]. Once biofilm is established, the infection becomes highly resistant to both antibiotic therapy and host immune response, often necessitating implant removal for definitive control [11].

Several risk factors have been identified, including postoperative hematoma, seroma, high implant volume, excessive wound tension, radiotherapy, smoking, and systemic diseases

that impair microvascular perfusion or immune function [12-15]. In this context, Crohn's disease a chronic inflammatory bowel disorder characterized by dysregulated immune activation and systemic inflammation—has been associated with delayed wound healing and increased postoperative infectious complications, even in periods of clinical remission [16, 17].

Currently, management of implant extrusion remains controversial. While isolated case series have described successful salvage procedures through aggressive debridement, pocket irrigation, and immediate re-implantation in carefully selected patients, success rates rarely exceed 60-70%, and outcomes are markedly poorer in cases of extensive soft-tissue loss, necrosis, or polymicrobial infection [18-20]. Consequently, most contemporary authors advocate for implant explantation, targeted antibiotic therapy guided by culture results, and delayed reconstruction once tissue integrity and sterility are re-established [21-23].

The following case describes a patient with a history of Crohn's disease who developed a polymicrobial infection involving ESBL-producing Klebsiella pneumoniae and Pseudomonas aeruginosa, leading to extrusion of a breast implant 66 days after primary surgery. This report highlights the diagnostic challenges and surgical decision-making process in a high-risk patient, emphasizing the importance of individualized timing for reconstruction.

Case Presentation

A 38-year-old woman from Puerto Rico, with a past medical history significant for Crohn's disease in clinical remission and no other comorbidities, underwent bilateral breast augmentation with mastopexy combined with abdominoplasty in Bogotá, Colombia, on July 5th, 2025. The procedure was performed in an accredited private clinic under general anesthesia. The implants used were round, smooth, silicone-filled prostheses placed in a dual-plane pocket, and closed in layers with absorbable sutures. Prophylactic intravenous cefazolin 2 g was administered perioperatively according to institutional protocol.

The immediate postoperative course was uneventful. The patient remained hospitalized for 24 hours and was subsequently discharged to a post-surgery care facility in Bogotá for monitoring. An outpatient review on July 17th, 2025 (postoperative day 12) revealed symmetrical breasts with intact skin envelopes, mild edema, and light erythema in the inferior poles, consistent with normal early healing. There was no evidence of wound dehiscence, drainage, or implant exposure (Figure 1).

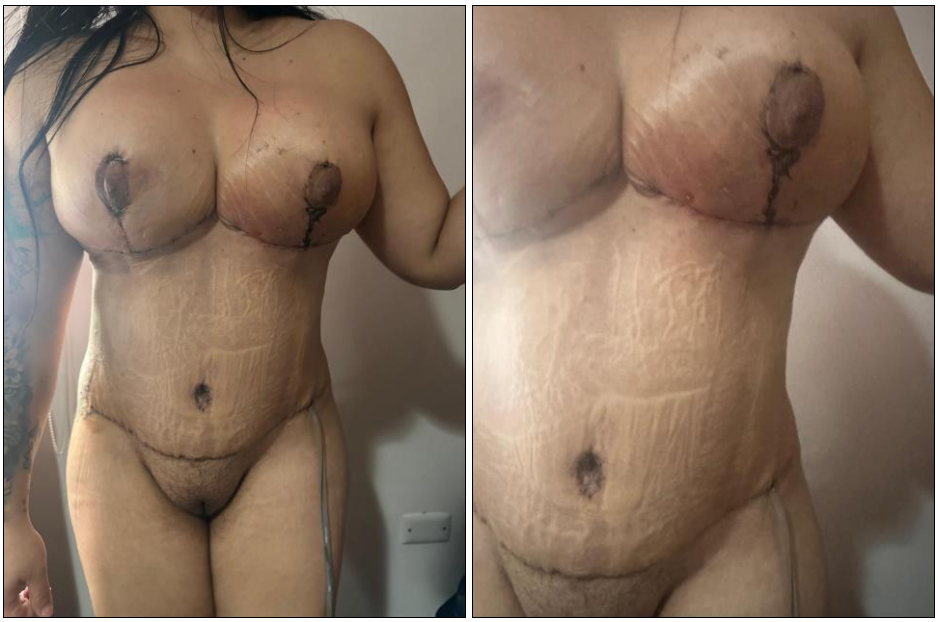

Fig 1: Postoperative day 12 pictures follow up. Note that there were no clear signs of infection.

On July 18th, 2025, the patient traveled back to Puerto Rico to continue her convalescence. Approximately three weeks later, she noticed serous wound drainage from the inferior pole of the left breast. She was sent to medical attention in her home country, and on August 6th, 2025, a wound culture obtained grew Pseudomonas aeruginosa, which was susceptible to antipseudomonal antibiotics including piperacillin/tazobactam, cefepime, ceftazidime, imipenem, meropenem, ciprofloxacin, and amikacin. No imaging was performed at that time. Conservative local wound care and oral antibiotics were initiated, with partial improvement.

The patient returned to Bogotá on September 1st, 2025, reporting worsening erythema, foul-smelling drainage, and progressive skin thinning over the left breast. At her clinical evaluation on September 2nd (postoperative day 59), physical examination revealed complete extrusion of the left breast implant, through a 3-4 cm full-thickness defect located in the inferior pole, surrounded by erythematous, indurated, and necrotic wound margins. A moderate amount of purulent discharge was noted, and the implant was visibly contaminated and partially covered by fibrinous exudate (Figure 2). The right breast and abdominal wounds were unremarkable.

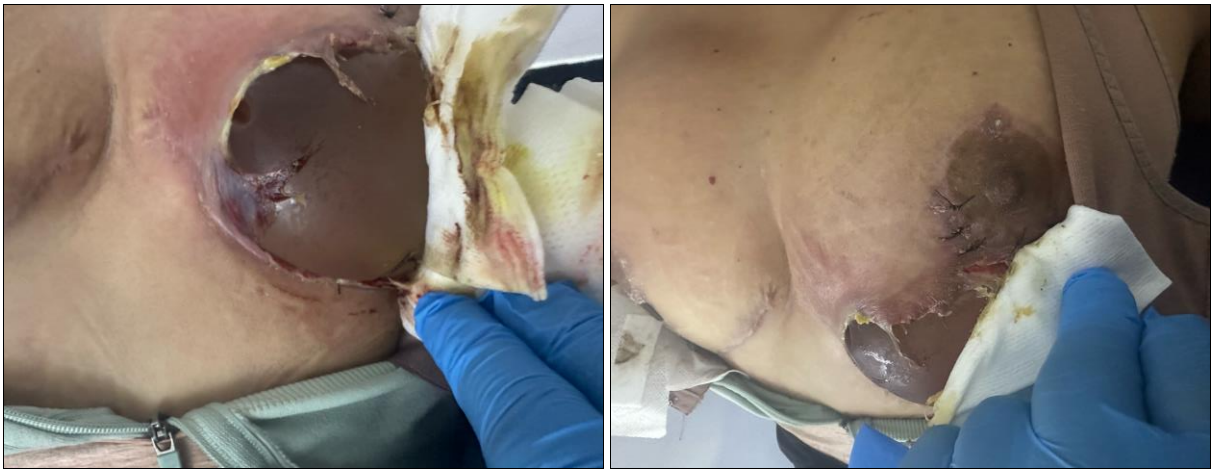

Fig 2: Breast implant extrusion, note a full thickness defect with necrotic borders and frailness of soft tissues. A. Frontal view. B. Side view

A new wound culture demonstrated polymicrobial infection with extended-spectrum β-lactamase (ESBL)-producing Klebsiella pneumoniae and *Pseudomonas aeruginosa*. Antimicrobial susceptibility testing revealed that the *K. pneumoniae* isolate was sensitive to carbapenems (imipenem, meropenem, ertapenem) and amikacin, but resistant to fluoroquinolones and β-lactam/β-lactamase inhibitor combinations; *P. aeruginosa* remained sensitive to β-lactam and carbapenem agents.

Given the extensive tissue necrosis and polymicrobial infection, the patient was scheduled for surgical management. On September 9th, 2025 (postoperative day 66), under general anesthesia, the left breast implant was completely explanted. Intraoperative findings included loss of soft-tissue coverage in the lower pole, capsular inflammation, and friable tissue without evidence of abscess cavity. The pocket was thoroughly irrigated with pulsatile saline lavage and left open for secondary healing. The area was temporarily covered with sterile dressings, and wound cultures were again obtained for microbiologic confirmation.

Postoperatively, the patient received meropenem 1 g intravenously every 8 hours for 14 days (September 9th to 23rd, 2025), based on the antibiogram. Her inflammatory markers (C-reactive protein and leukocyte count) progressively normalized, and wound drainage ceased within one week. Beginning on September 11th, 2025, she underwent daily wound care with Aquacel Ag® and serial debridements to promote granulation tissue formation and optimize the wound bed for closure with VAC therapy (Figure 3).

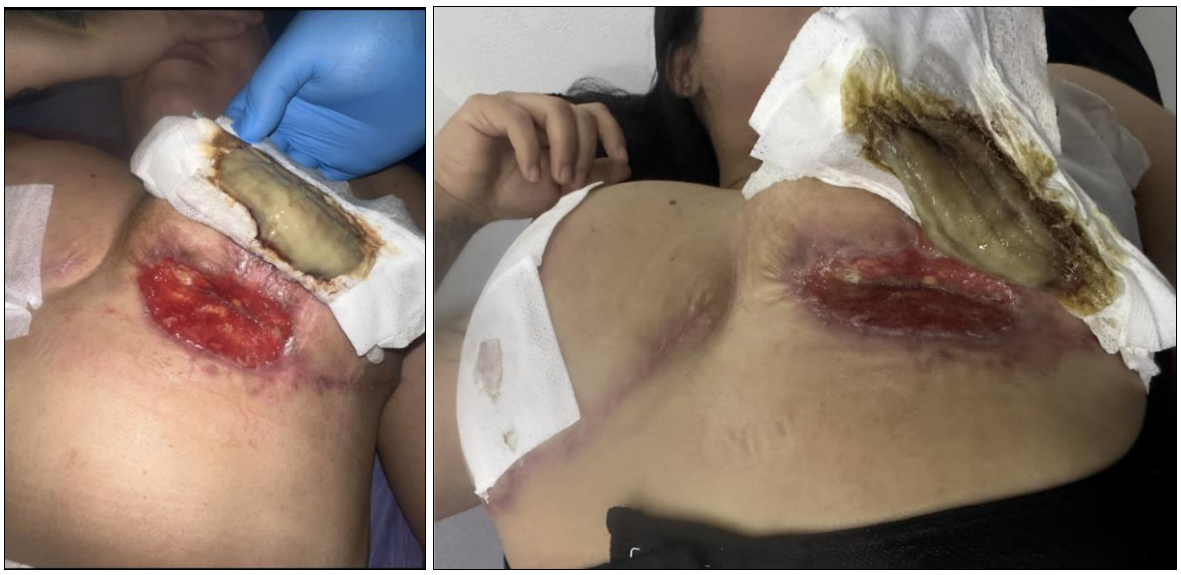

Fig 3: Post-operative day 84, patient already underwent serial debridements, secondary wound healing with VAC therapy, note the Aquacel Ag® green degradation. **Fig 4:** Post-operative day 88. Patient with a better tissue but still with a full thickness defect.

By October 2nd, 2025 (post primary surgery day 89), during the scheduled surgical assessment for breast reconstruction, intraoperative exploration demonstrated insufficient viable soft tissue to permit immediate placement of a new implant. The overlying mastectomy flap and inferior pole skin were thin and inelastic, averting adequate prosthetic coverage (Figure 5). Consequently, reimplantation was deferred, and the surgical team opted for reconstruction using a local advancement flap at a later stage, once the tissue quality and perfusion had improved (Figure 6). Also the surgical team decided to extract the right side implant.

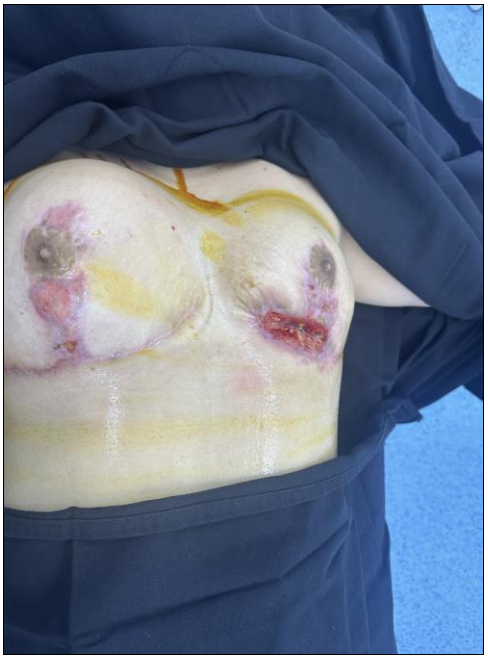

Fig 5: Pre- reconstruction picture. Initial surgical plan was to place a new smaller implant, however it was not possible due to the visible lack of soft tissues.

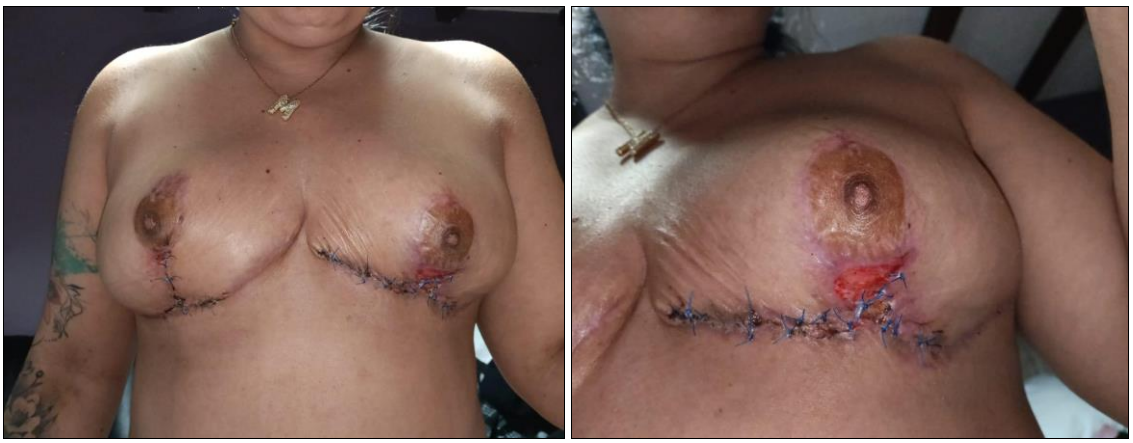

Fig 6: Picture after breast reconstruction with local flap advancement

At the time of this report, the patient remained afebrile, without clinical or laboratory evidence of ongoing infection, and demonstrated progressive wound contraction with healthy granulation tissue formation. She continues follow-up in her home country with planned delayed reconstruction approximately three to six months after complete wound healing.

Discussion

Breast implant extrusion remains one of the most challenging complications in aesthetic and reconstructive breast surgery. Although relatively uncommon with reported rates ranging between 0.2% and 2.5%, depending on patient selection and procedural context [1-3] its impact on patient morbidity, aesthetic outcome, and psychological wellbeing is profound. The pathogenesis is multifactorial, involving the interaction of bacterial colonization, impaired soft tissue perfusion, and mechanical tension over incisions [4, 5].

In the present case, extrusion occurred 66 days after primary surgery, following a sequence of events that included local infection, wound breakdown, and eventual necrosis of the inferior pole. The polymicrobial infection caused by *Pseudomonas aeruginosa* and extended-spectrum β-lactamase (ESBL)-producing Klebsiella pneumoniae presented a unique therapeutic challenge due to the resistant nature of the organisms involved.

The pathophysiology of implant extrusion is closely related to biofilm formation and subclinical infection. Bacterial biofilms have been demonstrated on up to 50-60% of removed breast implants, even in the absence of overt clinical infection [6, 7, 11]. Once established, biofilms provide a protective microenvironment that renders bacteria up to 1,000 times more resistant to antibiotics and host immune responses [6, 11]. Common organisms include *Staphylococcus epidermidis*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa* [8].

The emergence of multidrug-resistant (MDR) Gram-negative bacteria, particularly ESBL-producing *Enterobacteriaceae*, has complicated postoperative infections in plastic surgery worldwide [9, 10, 24]. *Klebsiella pneumoniae* harboring ESBL enzymes (most often CTX-M, SHV, or TEM types) are capable of hydrolyzing third-generation cephalosporins and aztreonam, leaving carbapenems as the only reliable therapeutic option [10, 25]. Coinfection with *Pseudomonas aeruginosa*, known for its

intrinsic resistance mechanisms and ability to form biofilms, further increases the likelihood of treatment failure [26].

In this patient, the first isolate (*P. aeruginosa*) was susceptible, while the second culture revealed an ESBL-producing *Klebsiella pneumoniae* and *P. aeruginosa* coinfection. Such secondary infections are often favored by repeated manipulation, wound maceration, and partial antibiotic exposure conditions typical of extruding wounds [27, 28].

Multiple local and systemic factors contribute to the risk of implant extrusion. Local factors include inadequate soft tissue coverage, high implant volume, poor pocket vascularity, seroma, hematoma, and tension on the incision [12-15]. Systemic factors such as diabetes, smoking, corticosteroid use, obesity, and autoimmune or inflammatory diseases also impair tissue healing [13-16].

The patient's underlying Crohn's disease is particularly relevant. Even in remission, Crohn's disease is associated with chronic systemic inflammation, altered cytokine expression, and impaired collagen deposition, which can delay or disrupt normal wound healing [16, 17, 29]. Studies have shown that patients with inflammatory bowel disease have 2-3 times higher rates of postoperative wound complications, including infection and dehiscence, compared to the general population [29, 30]. Moreover, some immunosuppressive therapies commonly used in Crohn's disease such as corticosteroids, azathioprine, or biologics may further impair local immune defenses and fibroblast function [31, 32].

The management of infected or exposed implants has evolved over the past two decades. Early reports described "salvage procedures" involving aggressive pocket irrigation, debridement, and immediate replacement with a sterile implant, with reported success rates between 60% and 70% (18-20). However, outcomes were strongly dependent on infection severity, bacterial virulence, and tissue viability. More recent multicenter studies and systematic reviews confirm that salvage is only appropriate in cases of limited exposure (<1 cm), minimal necrosis, monomicrobial infection by sensitive organisms, and well-vascularized soft tissue [21-23, 33].

In the current case, the patient presented with extensive soft-tissue necrosis and polymicrobial infection including a highly resistant Gram-negative pathogen, making immediate salvage or reimplantation unsafe. The presence of Crohn's disease further compromised tissue quality and regenerative capacity. For these reasons, complete explantation, followed by wound debridement and targeted antibiotic therapy, was considered the optimal and safest course of action, consistent with evidence-based recommendations [21-23, 33, 34].

The Infectious Diseases Society of America (IDSA) recommends carbapenems (meropenem, imipenem, or ertapenem) as the drugs of choice for serious infections caused by ESBL-producing Enterobacterales [10, 25, 35]. In this case, meropenem was selected given its excellent soft-tissue penetration and activity against both *Klebsiella* and *Pseudomonas* species. A 14-day course of intravenous therapy was administered following complete explantation and debridement. This approach aligns with published data indicating that antibiotic therapy alone is rarely curative in the presence of an implant, but is highly effective once the prosthesis is removed [11, 21, 25, 35].

Following explantation, the principal concern becomes timing of reconstruction. Immediate replacement is contraindicated in cases with active infection, necrosis, or poor soft-tissue coverage [18, 20, 33]. Most authors recommend delayed reconstruction once infection has resolved and the soft tissues have fully healed typically after 3 to 6 months [21-23, 33, 36].

In the present patient, an attempt at surgical reassessment for reconstruction on October 2, 2025 (postoperative day 88) revealed insufficient viable soft tissue to safely accommodate a new implant. The inferior pole skin was thin and nonpliable, precluding tension-free closure. Therefore, prosthetic reimplantation was deferred, and the patient had a planned local flap advancement to restore coverage before considering any future implant.

The use of autologous tissue reconstruction, such as local advancement or thoracodorsal artery perforator flaps, has been advocated as a reliable method to restore vascularized coverage in patients with compromised soft-tissue envelopes [37-39]. These techniques may provide a more durable solution than secondary implant replacement, particularly in high-risk patients or those with systemic inflammatory conditions.

Conclusions

This case illustrates the complex interplay between local infection, tissue viability, and systemic health in determining outcomes after prosthetic breast surgery. Although breast implant extrusion remains relatively rare, its consequences are significant, particularly when MDR pathogens and systemic inflammatory conditions such as Crohn's disease coexist.

In this patient, extrusion occurred 66 days postoperatively and was precipitated by polymicrobial infection with *Pseudomonas aeruginosa* and ESBL-producing Klebsiella pneumonia a combination that severely limited antimicrobial options and mandated complete explantation. The presence of Crohn's disease, even in remission, likely impaired wound healing and further predisposed the patient to soft-tissue failure. These factors collectively rendered immediate salvage or reimplantation unsafe.

Finally, this case highlights the importance of multidisciplinary management, involving plastic surgeons, infectious disease specialists, and wound care teams, to optimize both infection control and reconstructive success. The approach of complete explantation, meropenem therapy, structured wound conditioning, and deferred reconstruction is a safe, evidence-based algorithm for managing complex implant extrusions in high-risk patients.

Take home messages

1. Timely recognition and aggressive management of early infection are essential to prevent implant extrusion.
2. Biofilm-associated infections involving resistant Gram-negative bacteria require both surgical and antimicrobial control.
3. Patients with Crohn's disease or other inflammatory disorders represent a high-risk subgroup where tissue healing and immune responses may be impaired.
4. Immediate reimplantation is contraindicated when facing polymicrobial or ESBL infections, extensive necrosis, or inadequate tissue coverage.
5. Delayed reconstruction, with or without autologous flap reinforcement, offers the highest likelihood of long-term success and aesthetic satisfaction.

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