What is your diagnosis?

A 23 year-old female, on post-operative day 9 after an uneventful emergency caesarean section because of non-progress of labour, was referred to our facility with surgical site infection. She gave a history of generalised abdominal pain with excessive pain at the incision site, along with purulent discharge from day 3 after surgery with complete gaping of the wound on day 6 after surgery. She had mild pallor, no icterus and was afebrile. Pulse rate was 116 beats per minute and blood pressure 110/70 mmHg. On examination there was complete dehiscence of the caesarean wound with partially intact rectus sheath. The wound was foul smelling with purulent discharge and sloughing. There was a necrotic base, undermined irregular borders with multiple surrounding erythematous lesions. A similar lesion, 4x5 cm in size was also noted in the mid lower back, corresponding to the site of spinal anaesthesia (Figure 1a, b).

Blood investigations revealed haemoglobin 9 g/dL, white blood cell count $18.7x10^9$/L including 90.8% neutrophils, platelets $8.32x10^6$/dL and serum procalcitonin level of 32.3 ng/mL. Liver and Kidney function tests were normal and viral markers were negative. The patient was empirically started on broad spectrum intravenous antibiotic (piperacillin tazobactam 4.5 gm intravenously 8 hourly) with an-aerobic cover (metronidazole 100 mg 8 hourly). Meanwhile, to rule out any underlying dermatological disease, a dermatology opinion was sought and biopsies from the two wounds were sent for histopathology examination.

Wound swab culture revealed growth of *Escherichia coli* and *Enterococcus faecalis* with sensitivity to colistin. Piperacillin tazobactam was stopped and intravenous colistin was started. Blood and urine cultures were sterile. Wound debridement of the surgical site was done twice, on days two and five after admission, under intravenous sedation and local anaesthesia. With continuation of antibiotics and twice daily saline dressings, the sloughing gradually cleared but there was no sign of wound healing or even shrinkage of the wound (Figure 1c). Histopathological examination of the skin biopsies revealed mild spongiosis in the epidermis, infiltration of neutrophils around hair follicles, together with multiple focal neutrophilic collections in the dermis (Figure 1d, e).

It was planned to start the patient on high dose, systemic corticosteroids once the wound was free of infection. An early start of systemic corticosteroid is known to cause rapid stabilization of the disease process (1), however, since the wound was infected with virulent bacteria, initiating high dose systemic corticosteroids could have risked flare up of sepsis and deterioration of the general condition of the patient. Tab prednisolone at 1 mg/kg was started on post-operative day 28 when three consecutive wound cultures had all been negative, and leukocyte count and serum pro-calcitonin returned to normal limits. Both wounds showed rapid clinical improvement with the appearance of granulation tissues and reduction of size. Patient was discharged on oral steroids and with a plan to taper the steroid dose. She was regularly followed up. Complete wound healing with secondary intention was noted on postpartum day 92 (Figure 1f).

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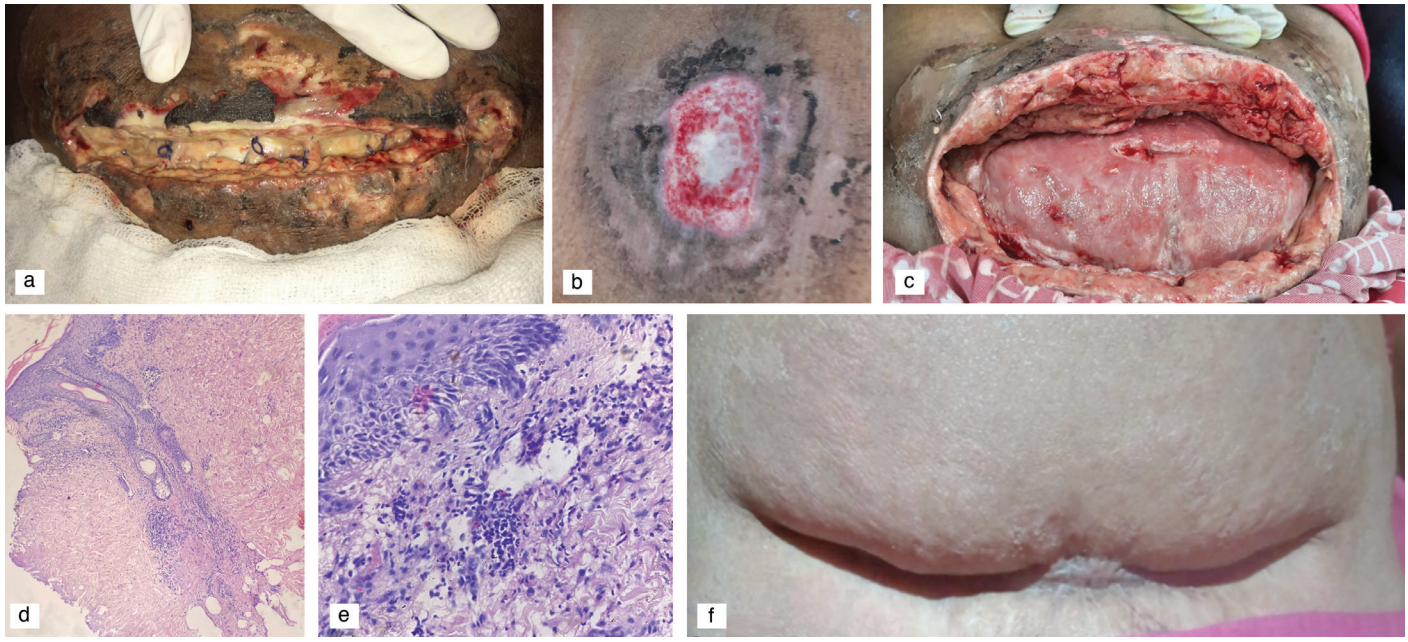

Figure 1. (a). Large gaping wound of the cesarean section; necrotic base, sloughing, purulent discharge, and undermined irregular borders with multiple surrounding erythematous lesions. (b) Wound at the site of spinal anesthesia. (c) Wound after second debridement; significant reduction in sloughing and discharge is evident however there has been an increase in the size of the defect due to pathergy. (d) Section (20x) showing epidermal spongiosis and inflammatory infiltrate around hair follicles with a few focal infiltrates in the dermis. (e) Section (40x) shows focal neutrophilic abscesses in the dermis. (f) Complete wound healing by secondary intention after starting steroids on post-operative day 92

Answer

Histopathological examination was consistent with the diagnosis of pyoderma gangrenosum (PG).

PG is a reactive, non-infectious, inflammatory dermatosis falling under the spectrum of neutrophilic dermatoses. There are several subtypes, with "classical ulcerative PG" as the commonest form, occurring in approximately 85% of cases. This type presents as an extremely painful erythematous lesion which rapidly progresses to a necrotic ulcer with characteristic violaceous undermined edges. Associated symptoms include fever, malaise, myalgia and arthralgia. Healing occurs with an atrophic cribriform scar. Other subtypes include bullous, vegetative, pustular, peristomal and superficial granulomatous variants. Pathergy, the phenomenon whereby skin trauma provokes lesions or the first onset of the disease at the site of injury, is present in 10-40% of PG. The differential diagnosis of PG includes all other causes of cutaneous ulceration and the diagnosis of PG is in reality a diagnosis of exclusion. Underlying systemic conditions are found in up to 50% of cases, with the most common being inflammatory bowel disease and rheumatoid arthritis (1,2).

Post-surgical PG is due to pathergy and the subsequent development of PG lesions at a surgical incision site in the immediate post-operative period. Patients usually present with fever, malaise, and areas of wound dehiscence, that progress to painful ulcers with violaceous, undermined borders, within an average of seven days into the post-operative period. Even though postsurgical PG after breast, chest, cardiothoracic or orthopaedic surgeries are known, reports of the occurrence of PG after caesarean sections are few (3-5) PG should be considered in the differential diagnoses of suspected surgical wound infection (6). In the presented case, the presence of a similar ulcerative lesion at the site of spinal anaesthesia led us to suspect pathergy and consider PG as one of the differentials. The true diagnosis of PG is challenging. Diagnostic criteria for classic ulcerative PG have recently been validated by means of a Delphi consensus of international experts (7). According to this diagnostic model, the one major criterion and 4 of 8 minor criteria are required for the diagnosis of PG.

Major criteria

1. Biopsy with neutrophilic infiltrate.

Minor criteria

1. Exclusion of infection on histology,
2. Pathergy,
3. Personal history of inflammatory bowel disease or inflammatory arthritis,

4. Papule, pustule, or vesicle that ulcerates within four days of appearance,
5. Peripheral erythema, undermining border, tenderness at site of ulceration,
6. Multiple ulcerations (at least one occurring on an anterior lower leg),
7. Cribriform or wrinkled paper scars at healed ulcer sites,
8. Decrease in ulcer size after one month of initiating immunosuppressive treatment.

The Paracelsus score is another novel diagnostic tool for PG (8).

The three major diagnostic criteria include:

1. Progressive disease;
2. Assessment and absence of relevant differential diagnoses;
3. Reddish-violaceous wound border.

Minor criteria include:

1. Amelioration (alleviation) by immunosuppressant drugs;
2. Characteristically irregular shape of ulceration;
3. Extreme pain >4/10 on visual analogue scale;
4. Location of lesion at the site of trauma.

Three additional criteria are:

1. Suppurative inflammation in histopathology;
2. Undermined wound margins;
3. Concomitant systemic disease.

The initial letters of the above-listed criteria form the acronym Paracelsus. Each major criterion is given 3 points, each minor criteria 2 points and each additional criterion 1 point. The sum total score of 10 or more indicates a high likelihood of PG (8).

The treatment of choice for idiopathic PG is systemic corticosteroids. Cyclosporine A, mycophenolate mofetil and tumour necrosis factor-alpha inhibitors are viable second line or adjuvant options (9). In addition, small studies have been published with successful therapeutic intervention using alefacept, visilizumab or anakinra but controlled trials are warranted (10). Although systemic immunosuppressants remain the therapy of choice for most cases of PG, a local approach may also be considered in localized disease. Recently, topical tacrolimus has successfully been used as an off-label drug in localized disease (11).

The role of surgery is controversial because of the risk of pathergy (12). Skin debridement should be avoided in patients with PG, as further surgical insult would only increase the size of the lesion. In the presented case, however, we unknowingly debrided the wound twice due to the presence of the gross infection and sloughing, while awaiting histopathological confirmation. There has been a report of a case of PG after caesarean delivery, which initially mimicked wound infection and was successfully treated with vacuum-assisted closure and split-thickness skin graft. This synergistic approach with vacuum-assisted closure could be an important treatment option for aggressive, wide and slow-healing lesions (13).

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