

Pyoderma Gangrenosum, Rare Parietal Complication after Colorectal Surgery

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Rezumat

Pyoderma gangrenosum, complicație parietală rară după chirurgie colo-rectală

Pyoderma gangrenosum (PG) este o boală rară cronică inflamatorie distructivă a pielii caracterizată prin prezența de noduli și de pustule cu ulcere care cresc progresiv și/sau necroză cutanată. În multe cazuri PG este idiopatică, dar uneori este asociată cu afecțiuni ce prezintă vasculite, cum ar fi gammapatiile, bolile inflamatorii intestinale sau artrita cronică. PG nu este nici infecțioasă, nici gangrenoasă, dar unii autori au avansat teoria că ar avea o etiologie infecțioasă (streptococi și stafilococi). Recent, s-a raportat în literatura de specialitate că PG este o afecțiune care poate apărea după traumatisme locale, în special chirurgicale. Prezentăm cazul unui bărbat în vârstă de 73 ani, care s-a internat în Clinica de Chirurgie cu adenocarcinom rectal și care a dezvoltat postoperator placcarde cutanate bine delimitate, vegetative, cu dimensiuni între 2 și 5 cm în diametru, cu ulceratii centrale asociate cu necroză și o secreție purulentă, delimitate de margini cenușii, elevate. Aceste leziuni au fost localizate pe abdomen și este important de menționat că au apărut în jurul firelor de la sutura cutanată folosite în timpul intervenției chirurgicale, fără a avea și alte

localizări și fără a se asocia cu prurit sau durere. S-au efectuat două examene histopatologice diferite, unul din piesa rectală și altul din biopsia cutanată. Primul a evidențiat un adenocarcinom rectal și colită nespecifică, al doilea punând diagnosticul de pyoderma gangrenosum, etapa ulcerativă. Pacientul a răspuns clinic foarte bine la terapia cu steroidiene sistemice.

Cuvinte cheie: Pyoderma gangrenosum, cancer rectal

Abstract

Pyoderma gangrenosum (PG) is a rare chronic destructive inflammatory skin disease characterized by the presence of nodules and pustules with progressively enlarging ulcers and/or cutaneous necrosis. In most cases PG is idiopathic, but sometimes it is associated with conditions that often have vasculitis, such as gammopathies, inflammatory bowel diseases or chronic arthritis. PG is neither infectious nor gangrenous, but some authors advanced the theory that an infectious etiology (streptococci and staphylococci) could be incriminated. Recently, there are reports in the literature stating that PG is a condition that can occur after local trauma, especially surgery. We report the case of a 73 year old man who presented himself to the Surgery Department with rectal adenocarcinoma and postoperatively developed well-demarcated, vegetative plaques, ranging from 2 to 5 cm in diameter, with central ulceration associated with necrosis and a purulent secretion, delimited by raised, dusky erythematous borders. These lesions were located on the abdomen and it is important to mention that the injuries occurred at the site of surgical stitches used during the rectum

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amputation surgery, with no other anatomical locations, pruritus or pain associated. We performed two different histopathological examinations for this patient, regarding the rectal specimens and the cutaneous specimen. The first examinations revealed rectal adenocarcinoma and nonspecific colitis. The second examination was concluded with the diagnosis of pyoderma gangrenosum, the ulcerative stage. The patient had a very good clinical response to systemic steroid therapy.

Key words: Pyoderma gangrenosum, rectal cancer

Introduction

Pyoderma gangrenosum (PG) is a rare chronic destructive inflammatory skin disease characterized by the presence of nodules and pustules with progressively enlarging ulcers and/or cutaneous necrosis. In most cases PG is idiopathic, but sometimes it is associated with conditions that often have vasculitis, such as gammopathies, inflammatory bowel diseases or chronic arthritis. PG is neither infectious nor gangrenous. Brunsting, Goeckerman and O'Leary established this terminology (pyoderma gangrenosum) and advanced the theory that an infectious etiology (streptococci and staphylococci) could be incriminated (1). Recently, there are reports in the literature stating that PG is a condition that can occur after local trauma, especially surgery (2,3,4).

Case report

After a full oncological evaluation (colonoscopy with biopsy,

pelvic MRI and abdominal and chest CT) the patient BI (No. 46501/2012), male, 73, was diagnosed with lower rectal cancer. The investigations outlined T3N0M0 rectal tumor diagnosis. The lower limit of the tumor was estimated at 1 cm above the anal sphincter. Before hospitalisation in our clinic for surgery, the patient had received neoadjuvant chemotherapy and radiotherapy. We planned a rectal resection with total mesorectal excision (TEM) and delayed colo-anal anastomosis (DCA). The first intervention was conducted on September 27, 2012. We performed a rectal resection with TEM at the upper edge of the internal anal sphincter. The descending colon was lowered for about 10 cm through the anal sphincter and anchored to the inner margin of the thigh to keep it in this position. (Fig. 1) Extemporaneous examination of the resection edge was inconclusive. For this reason a second surgery was scheduled 10 days later, when the final result was obtained. It showed carcinoma invasion in the rectal edge. This led to the idea of changing the therapeutic tactic into a complete intervention with perineal resection of the anal canal and sphincter apparatus. During this period, the patient resumed its fecal transit through the transanal lowered stump; the perineal aspect was normal. Despite this, since the 7th post-operative day, at the abdominal incision small erythematous areas appeared, which increased progressively with an explosive evolution on day 9. The lesions developed looked like well-demarcated, vegetative plaques, ranging from 2 to 5 cm in diameter, with central ulceration associated with necrosis and a purulent secretion, delimited by raised, dusky erythematous borders. These lesions were located on the abdomen and it is important to mention that the injuries occurred at the site of inoculation of surgical stitches used during the first intervention, with no other anatomical locations, pruritus or pain associated. (Fig. 2) The aspect could suggest a rapidly



Figure 1. The descending colon lowered through the anal sphincter



Figure 2. Cutaneous lesions after the first intervention



Figure 3. The intraperitoneal appearance at reintervention



Figure 4. The lesions after 1 week post reintervention



Figure 5. The lesions after 3 weeks post reintervention

progressing septic complication with an intraperitoneal origin. This led us to the suspicion of an enteral infarction. On the tenth postoperative day we reoperated him as scheduled, performing, under the new strategy, perineal resection of the anal canal and sphincter apparatus and left iliac colostomy. There were no injuries and no sepsis to the intraperitoneal viscera found at laparotomy. (Fig. 3) The skin lesion previously described didn't extend beyond the dermis; subcutaneous adipose tissue and aponeurosis were free from any kind of lesions. Intraoperative dermatologic consultation raised suspicion of pyoderma gangrenosum with uncertain etiology. Biopsies were taken from the dermis. Postoperative evolution of the patient concerning rectal malignancy was simple.

According to the experience of the dermatologist that was consulted in this case and considering the postoperative status of the patient, dexamethasone treatment was initiated (8 mg/d) and also dapsone (50 mg/d). Because the patient developed anemia (although glucose 6 phosphate dehydrogenase activity tested before the initiation of the treatment was normal), dapsone was ceased and the treatment continued only with dexamethasone and then with prednisone with tapering doses with a favorable outcome in 6 weeks. (Fig. 4, 5, 6, 7)

The anatomopathologist performed two different histopathological examinations for this patient, regarding the rectal specimens and the cutaneous specimen. The first examinations revealed rectal adenocarcinoma and nonspecific colitis. The skin biopsy specimen was obtained from a lesion including the ulcerative central part of the lesion, passing nearby apparently healthy skin tissue. The histopathological examination of the cutaneous specimen showed the presence of an ulcerative area with marked fibronecrotic detritus, dermo-hypodermic exudation, polymorphic inflammation with

dermo-hypodermic suppurative necrosis and sequelar fibrosis. The hypodermis was involved at both septal and lobular compartment. Some blood vessels showed intramural fibrin deposits and leukocytoclastic vasculitis. The neutrophilic vascular reaction was partly folliculocentric. We performed some special stains in order to highlight the microbial agents. The epidermis near the ulcer showed a hyperplastic pattern and the squamous cells were reactively modified. The examination was concluded with the diagnosis of pyoderma gangrenosum, the ulcerative stage. (Fig. 8, 9, 10)



Figure 6. The lesions after 6 weeks post reintervention

Figure 7. The lesions 6 months after reintervention



Discussion

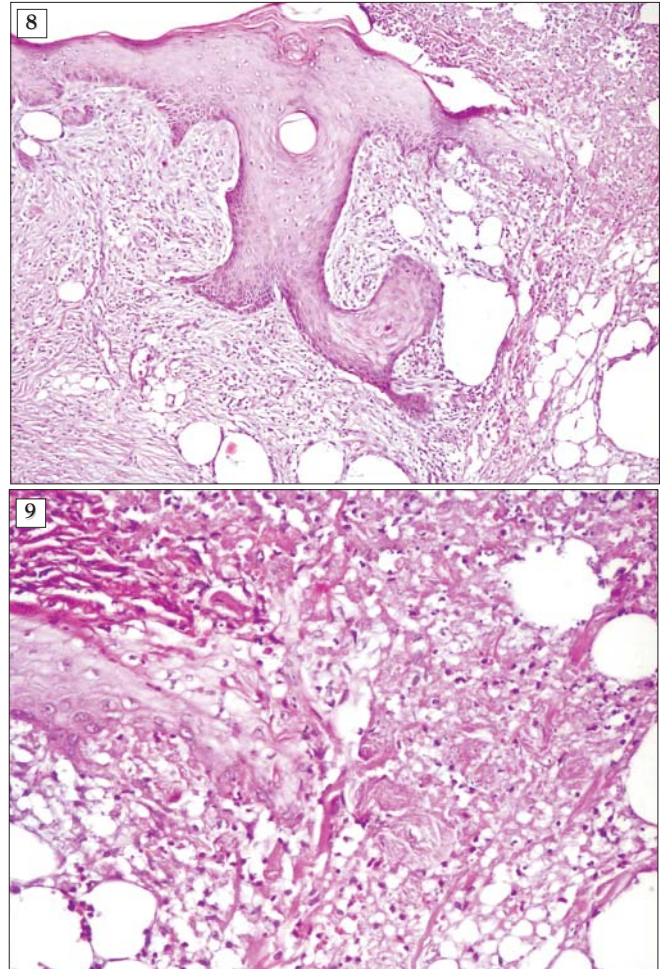
Pyoderma gangrenosum (PG) is an uncommon, chronic, recurrent cutaneous ulcerative disease with a distinctive morphologic presentation and uncertain etiology. It is a neutrophilic dermatosis that is frequently associated with a systemic disease (5,6).

All ages may be affected by the disease, but it predominantly occurs in the fourth and fifth decades of life, almost equally in both sexes.

The etiology of pyoderma gangrenosum is poorly understood. In almost half of the patients, the disease is idiopathic but it is often associated with a deregulation of the immune system (specifically, altered neutrophil chemotaxis) proved by the presence of pathergy. Pathergy is the term used to describe hyper-reactivity of the skin that occurs in response to minimal trauma (7) and is a cutaneous phenomenon seen in both pyoderma gangrenosum and Behçet's disease. This consists in development of skin lesions or ulcers that may be resistant to healing and can also present with ulcerations at the site of surgical incisions.

The most frequently associated diseases with pyoderma gangrenosum are: inflammatory bowel diseases (IBD) such as ulcerative colitis and Chron disease, rheumatoid arthritis, monoclonal gammopathy, leukemia. Less often, PG can be linked with gastric and duodenal ulcers, diverticulitis, osteomyelitis, hepatitis C, or solid tumors. PG can usually be the first sign of the underlying disease. Even if thought to be idiopathic, in time the patient can develop signs of an associated disease (8).

The diagnosis can usually be made based only on clinical features, the first presentation sign often being skin ulcers on the lower extremities, especially in the pretibial area, but also on the mucosa or peristomal sites (6). The initial lesion can



Figures 8, 9. Haematoxylin-eosin stain, 100x, 400x; epidermal ulceration with marked fibronecrotic detritus, polymorphic inflammation with dermo-hypodermic suppurative necrosis; the epidermis near the ulcer showed a hyperplastic pattern and the squamous cells were reactively modified

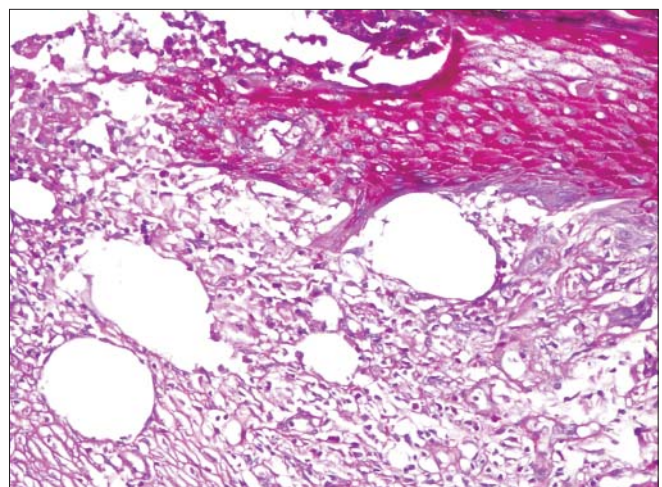


Figure 10. PAS stain, 400x; epidermal ulceration with fibronecrotic detritus and underlying polymorphic inflammation

often be missed because of the resemblance to an insect bite or a furuncle (an inflammatory red papule, pustule or nodule) (8). It can frequently be linked with a previous trauma caused by needles or by catheter tubes. The initial lesion rapidly extends into a large deep ulceration with an inflammatory border and a necrotic base. If there are multiple lesions, these can merge together. Important pain can be present and also arthralgias and malaise. General symptoms can vary from absent to a real toxic shock that can accompany a flare. Usually the lesions are aseptic but suprainfections can frequently occur.

Several variants of disease were described such as: the bullous pyoderma gangrenosum that is predominantly associated with hematologic malignancies, the malignant form with lesions on the head and neck, pyostomatitis vegetans (the oral form, associated with inflammatory bowel diseases), post-surgical cutaneous gangrene (also frequently associated with bowel inflammatory diseases), genital pyoderma gangrenosum, a superficial form, a subcutaneous form and an extracutaneous form (8).

The diagnosis is suggested by the clinical presentation and is helped by the histopathology exam, although the histopathologic findings in pyoderma gangrenosum are not specific. This shows neutrophilic infiltrates around blood vessels, hemorrhage, and necrosis of the overlying epidermis. Some authors also described vasculitic phenomena, but very rarely are all the features of a real vasculitis found. Even when the diagnosis is clear after the clinical examination, the biopsy is decisive in almost all instances because it is useful in the exclusion of other diseases, such as infections and malignancy.

Since there are no specific laboratory tests or histopathological features and some of the associated diseases may not be diagnosed when the lesions of PG appear, the physician must rule out other causes of epidermal ulceration and search for treatable associated disease. From the histopathological point of view, we had to exclude in our case follicular infections, cellulitis or cellulitis-like lesion, insect bite reaction, cutaneous T or B-cell lymphomas, panniculitides or Sweet's syndrome.

The present case cumulates several particularities that could be taken in consideration as possible ethiological factors for PG, such as: the underlying malignant disease (adenocarcinoma of rectum), inflammatory bowel disease (although it was an accidental discovery at histopathological examination), radiotherapy and surgical trauma.

Surgery performed before the appearance of the skin lesions was a rectal resection with total mesorectal excision (TEM) and delayed colo-anal anastomosis. The arguments in favor of this type of strategy compared with one-stage resection and anastomosis would be prevention of anastomotic fistula and avoidance to perform a protective ileostomy (9,10). In our practice we performed this type of surgery in 7 patients of which 6 with malignancy and one with benign disease (congenital megadiverticulosis). All cases had delayed colo-anal anastomosis within 5 days after rectal resection with good continence in 5 cases and partial continence in 2.

In order to minimize the risk of postoperative PG lesions several authors recommend the use of subcuticular sutures for

skin closure, thus avoiding puncturing the skin surface (11). Another recommendation is to choose the moment of performing a surgery when the patient is free of lesions of PG. In our case the lesions developed progressively after the rectal excision. The second intervention was performed in presence of full extended skin lesions with three purposes: high suspicion of intestinal infarction and septic peritonitis, partial ischemic changes of the colonic stump and oncological purposes. As mentioned above, relaparotomy did not reveal any necrotic lesions of the intestine or colon, with no septic intraperitoneal consequences.

Another important feature when PG appears at the surgery site is the possible confusion with an infection, associated with wound necrosis. It is very important to distinguish between PG and wound sepsis, especially because PG is not responsive to antibiotic therapy, but is usually early responsive to systemic corticosteroid therapy or other immune modulators. Peristomal pyoderma gangrenosum should be considered in all patients with IBD who have peristomal ulcerations. If the lesions are refractory to the local wound or antimicrobial treatment, prompt referral to a dermatologist or an internal medicine practitioner should be considered (12).

Many treatments were reported as effective for healing PG lesions: oral corticosteroids or intravenous pulsed steroids, azathioprine, cyclosporine, cyclophosphamide, dapsone, methotrexate, mycophenolate mofetil, anti tumor necrosis factor alpha agents (etanercept, infliximab, adalimumab), thalidomide, plasmapheresis, intravenous immunoglobulins, hyperbaric oxygenotherapy, radiation, electron beam therapy (13).

Conclusion

The present case illustrates the possibility of the appearance of PG in a surgical context, without any septic events both locally and generally.

The combination of previous inflammatory colitis, neoplasia and radiation therapy could be a plurality of risk factors for the appearance of rash.

Localization of the skin lesions strictly around stitches, including those of the drain tubes may incriminate a foreign body reaction and less the operative trauma itself.

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