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REVIEW

A systematic review of post-surgical pyoderma gangrenosum: Identification of risk factors and proposed management strategy

Kevin J. Zuo [a], Eric Fung [b], Edward E. Tredget [b], Andrew N. Lin [c,*]

[a] *Faculty of Medicine & Dentistry, University of Alberta, Edmonton, AB, Canada*
[b] *Division of Plastic & Reconstructive Surgery, Department of Surgery, Faculty of Medicine & Dentistry, University of Alberta, Edmonton, AB, Canada*
[c] *Division of Dermatology, Department of Medicine, Faculty of Medicine & Dentistry, University of Alberta, Edmonton, AB, Canada*

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KEYWORDS
Pyoderma gangrenosum;
Post-operative complications;
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Summary *Background:* Post-surgical pyoderma gangrenosum (PSPG) presents as a rapidly expanding cutaneous ulcer at a site of surgery with potentially devastating consequences. We systematically reviewed the English and foreign language literature to identify risk factors for PSPG and propose a management strategy.
Methods: A systematic review was completed in PubMed, Medline, Embase, and Cochrane Database for all published reports of PSPG from January 1946 to June 2013. We manually examined bibliographies for relevant references and used Google Translate for articles in foreign languages, including Italian, Japanese, German, Dutch, Turkish, Spanish, Chinese, Dutch, Russian, Portuguese, and Czech.
Results: We identified 220 cases of PSPG (mean age 52.8 years, range 5—85 years). Thirty-seven patients (16.8%) had a history of pyoderma gangrenosum, nineteen (8.6%) had a hematologic disorder such as leukemia or lymphoma, thirteen (5.9%) had inflammatory bowel disease, and eight (3.6%) had rheumatoid arthritis. PSPG occurred most commonly after breast (25%), cardiothoracic (14%), abdominal (14%), and obstetric (13%) surgeries. The most common breast procedures were bilateral reduction mammoplasty (45%), breast reconstruction (25%), and lumpectomy or mastectomy (11%). Signs of wound complication occurred on average 7.0 days after surgery. Nineteen patients (8.6%) at risk for PSPG received perioperative corticosteroids during skin grafting or later surgeries with a favorable outcome.

* Corresponding author. Division of Dermatology, Department of Medicine, Faculty of Medicine & Dentistry, University of Alberta, 2—104 Clinical Sciences Building, Edmonton, AB T6G 2G3, Canada.
E-mail address: anlin00@yahoo.com (A.N. Lin).

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Conclusions: Patients with a history of pyoderma gangrenosum, rheumatoid arthritis, inflammatory bowel disease, or hematologic malignancy who are undergoing breast, cardiothoracic, or abdominal surgeries should be carefully observed for post-operative ulceration at incision sites. Debridement should not be performed before dermatologic consultation to assess for PSPG. Patients at risk of PSPG undergoing breast surgery may benefit from perioperative prednisone to prevent PSPG which can lead to destructive wound enlargement and significant scarring.

Introduction

Pyoderma gangrenosum (PG) is a rare inflammatory skin disorder characterized by cutaneous papulo-pustules that evolve rapidly into large, painful, necrotic ulcers with violaceous, undermined edges (Figure 1). Biopsy findings are non-specific, and diagnosis centres on clinical presentation. In up to 50% of cases, lesions occur at sites of cutaneous trauma, a phenomenon known as pathergy.[1] These include sites of venipuncture, laparoscopy, and surgical incisions. Post-surgical pyoderma gangrenosum (PSPG) refers to the development of pyoderma gangrenosum at surgical sites in the immediate post-operative period. It is often initially diagnosed as wound infection; however, antibiotic therapy and wound debridement fail to arrest rapid ulcer enlargement. A high index of suspicion is required to diagnose PSPG, whose management involves systemic corticosteroid and other immunosuppressive agents. We analyzed all reported cases of PSPG in English and several foreign languages to identify risk factors, and propose guidelines for management and prevention.

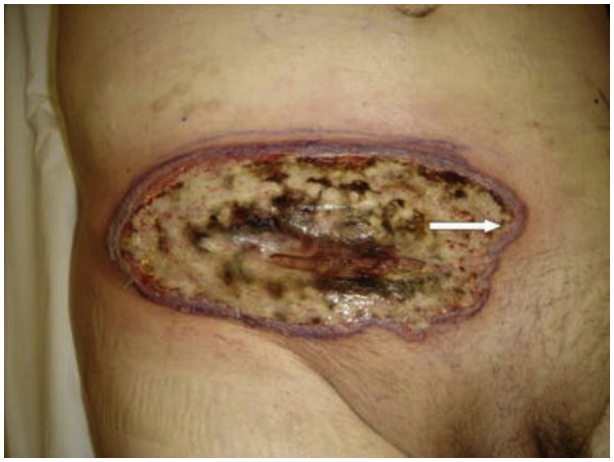

Figure 1 Pyoderma gangrenosum at the site of inguinal hernia repair, with the characteristic violaceous, undermined border (white arrow). *Reprinted with the permission of Springer from Kotzampassakis N and Ksontini R. Pyoderma gangrenosum after inguinal hernia repair. Hernia 2012:16:345—347.*

Methods

We systematically reviewed PubMed, Medline, Embase, and Cochrane database for all reports of PSPG published in English and other languages from January 1946 to June 2013, using "pyoderma gangrenosum," "surgery," "catheter," "tube," "surgical procedures," "intravenous," and "stoma" as MeSH terms and keywords. Inclusion criteria included all reports of PG developing after any form of iatrogenic skin trauma, including surgery, stoma creation, and needle punctures. A diagnosis of PG was accepted if the clinical presentation, disease evolution, negative wound cultures, negative serologic markers, past medical history, response to immunosuppressive therapy, and/or biopsy results were sufficiently consistent with PG to the attending physicians for them to make that diagnosis. Exclusion criteria were idiopathic (spontaneous) PG, cases of PG following non-iatrogenic pathergy including bites or blunt injury, and cases in which skin biopsy showed other causes of ulceration such as vasculitis. We manually examined the bibliographies of all selected articles to further identify relevant articles (Figure 2). We used Google Translate (www.translate.google.com) to translate articles published in languages other than English or French.

Due to inconsistent reporting of case details, we used the following parameters to calculate descriptive statistics:

1. Time to onset of PSPG was defined as the first post-operative day when local signs of wound complication were observed, not systemic symptoms such as fever or malaise.
2. All durations were recorded in days. Four weeks was recorded as 28 days and 1 month was recorded as 30 days.
3. Only reports of PSPG occurring within 30 days of surgical intervention were included in statistical analysis. Cases occurring after 30 days were included in the discussion in the text, where appropriate. Articles without information about PSPG onset were not included.

Results

We identified 1343 articles in the primary search, with only 153 articles fulfilling inclusion criteria after review by two independent reviewers (KJZ and ANL). Thirty-five additional articles were identified through bibliography cross-referencing, mostly foreign language articles.