Concurrent pyogenic granuloma and bullous impetigo of a pregnant woman's finger

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Abstract

Background: Bullous impetigo is a superficial skin infection caused by Staphylococcus aureus (S. aureus). Pyogenic granuloma is a common benign tumor frequently associated with prior trauma. Bullous impetigo and pyogenic granuloma may occur in pregnant women.

Purpose: The features of a pregnant woman with pyogenic granuloma and bullous impetigo concurrently present in a lesion on her finger are described.

Methods: PubMed was used to search the following terms: bullous impetigo, pregnancy, and pyogenic granuloma. All papers were reviewed; relevant articles, along with their references, were evaluated

Results: A red ulcerated nodule with a collarette of epithelium around the tumor and surrounding bullae appeared on the fifth digit of the left hand of a 31-year-old woman who was at 36 weeks gestation. A bacterial culture grew methicillin sensitive S. aureus. An excisional biopsy was performed. Histologic findings revealed not only a benign vascular tumor with an infiltrate of mixed inflammatory cells, but also an intraepidermal blister. She received oral antibiotics and there was complete resolution of the finger lesion and infection with preservation of digit function.

Conclusion: Albeit uncommon, pyogenic granuloma and bullous impetigo may concurrently occur in the same lesion. Therapeutic intervention should focus on treating both the benign skin tumor and the infection.

Keywords: bullous, concurrent, finger, granuloma, impetigo, pregnancy, pyogenic

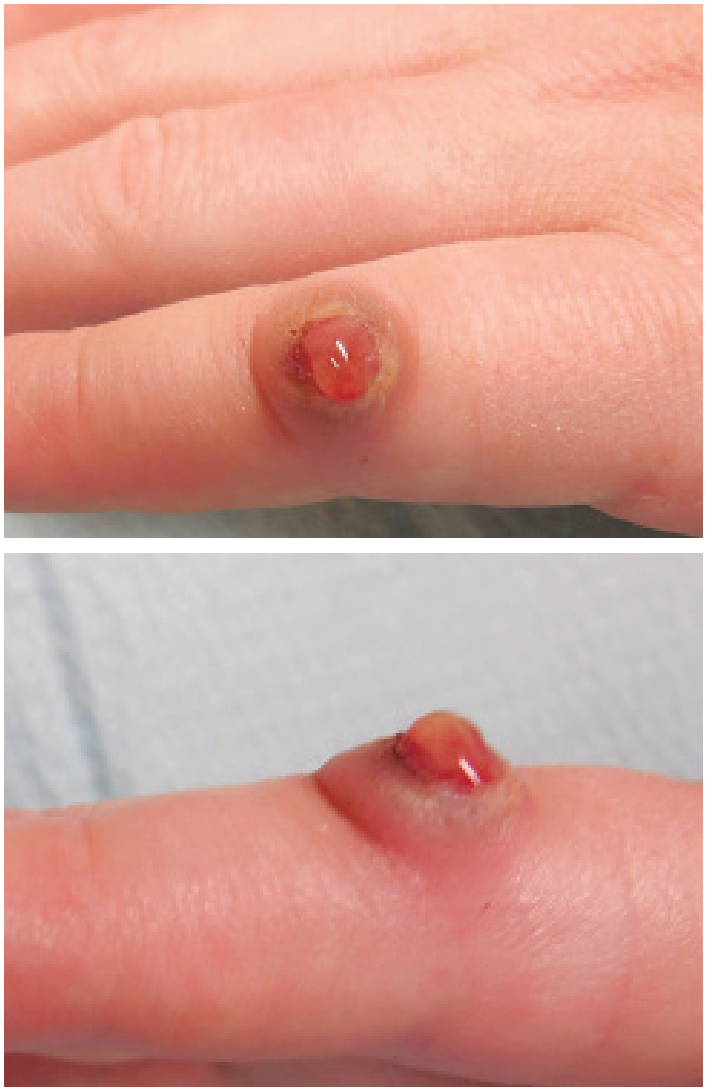

Figure 1. *Superior (top) and lateral (bottom) views of the left hand fifth digit show a 13x13mm lesion. The central portion of the lesion consists of a 6x6 mm red ulcerated nodule with a collarette of epithelium around the tumor; it is surrounded by a bulla.*

Introduction

Impetigo is a common bacterial infection. The causative organism is usually Staphylococcus aureus (S. aureus) with gram stain showing gram-positive

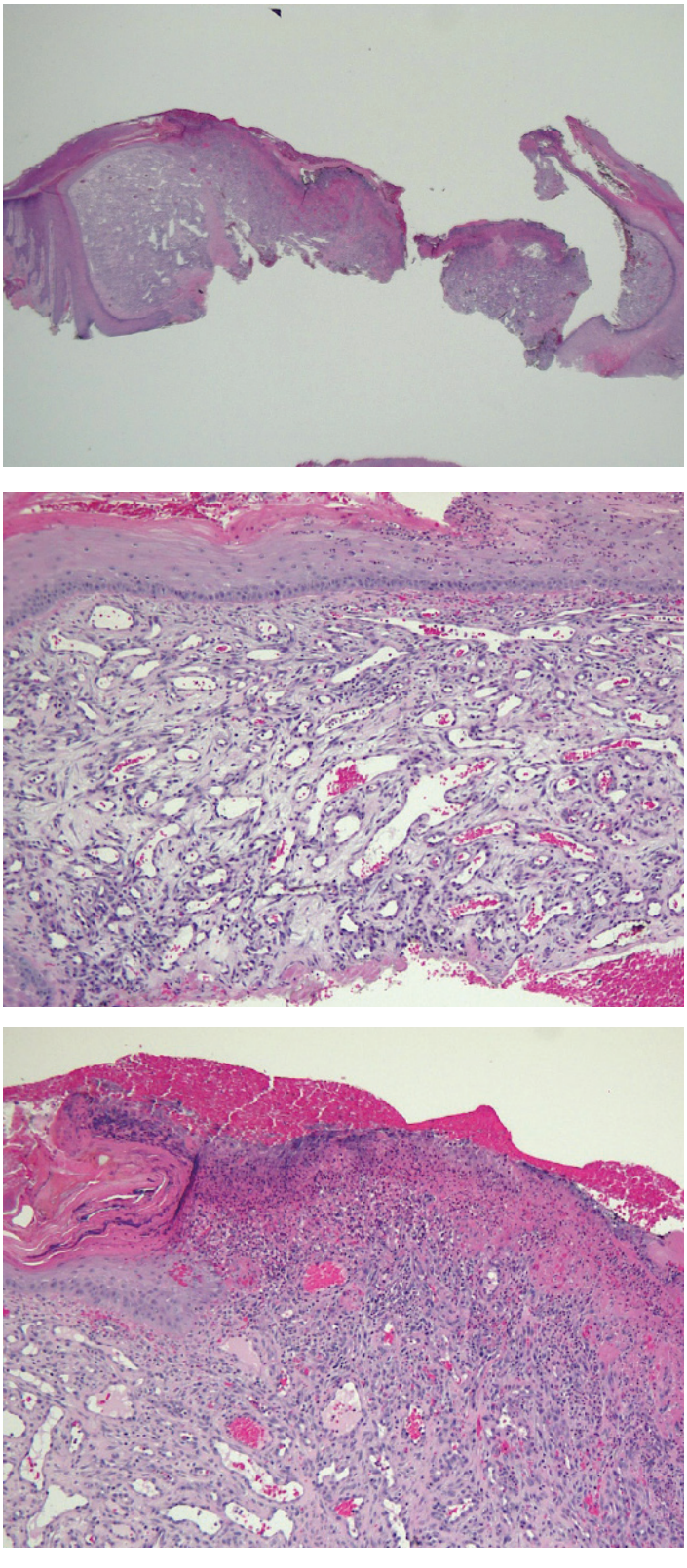

Figure 2. *(top, 2x) Microscopic examination of the shave excision specimen shows an ulcerated lesion with a collarette of epithelium that extended around the tumor. (middle, 10x) The tumor is comprised of endothelial-lined vessels. The surrounding fibrotic and edematous stroma contains a mixed inflammatory cell infiltrate. (bottom, 20x) At the lateral edge of the specimen, an intraepidermal blister containing blood and neutrophil is present.*

cocci in clusters. However, group A beta-hemolytic Streptococcus (S. pyogenes) is another common pathogen.

Bullous impetigo accounts for 30% of impetigo. Bullous impetigo results from S. aureus exfoliative toxins which target the desmosomal protein, desmoglein 1, resulting in acantholysis in the granular layer. Depending on the age of the lesion, bullous impetigo can present as either flaccid bullae, vesiculopustules, or red erosions with a collarette of scale [1].

Pyogenic granuloma is a benign, highly friable, vascular tumor. It is usually preceded by trauma. We describe a pregnant woman who developed a lesion on her finger that concurrently demonstrated bullous impetigo and pyogenic granuloma.

Case Synopsis

A G1P000 31-year-old woman at 36 weeks gestation developed a lesion on her left fifth digit two weeks earlier. The lesion was painful, bled frequently and was increasing in size. The patient was afebrile, and had no other systemic or dermatologic complaints.

Cutaneous examination revealed a 13x13 mm bullae with a collarette of epithelium surrounding a 6x6 mm red ulcerated nodule (**Figure 1**). An excisional shave biopsy was performed and the base of the lesion was hyfercated. Bacterial culture from the lesion was collected and the patient was empirically treated with 500 mg of cephalexin every 6 hours.

The bacterial culture grew methicillin-sensitive S. aureus and she was maintained on the antibiotic. Microscopic examination showed ulceration of the epidermis as well as a collarette of epithelium that extended around a vascular tumor. The tumor was compromised of endothelial lined vessels with a fibrotic and edematous stroma containing an infiltrate composed of mixed inflammatory cells. A blister within the upper layer of the epidermis, which contained blood and neutrophils, was present at the lateral part of the specimen (**Figure 2**).

The follow up visit 34 days after surgery showed that the site was completely healed with a red scar and that the digit's range of motion was completely preserved

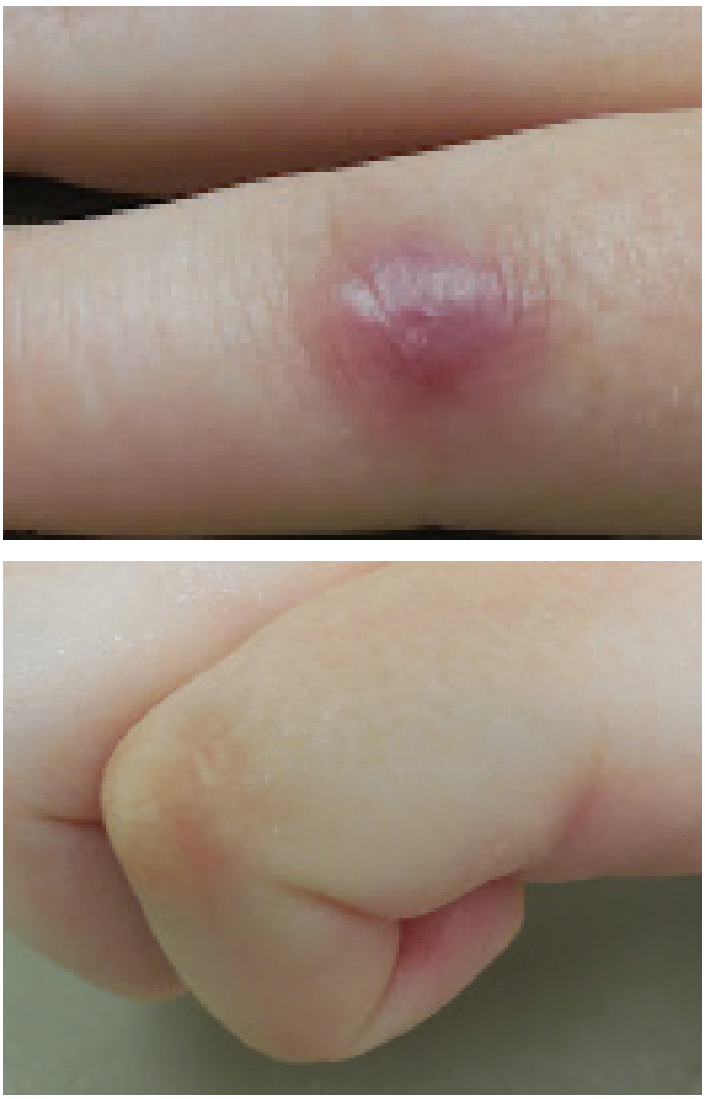

Figure 3. *Superior (top) and clenched (bottom) views of the left fifth digit. The finger is completely healed 34 days after biopsy, with a faint red scar. Clenching the finger demonstrates that the full range of motion of the digit is preserved.*

(**Figure 3**). The oral antibiotic was discontinued. Correlation of the history, clinical morphology, pathology, and culture results established a diagnosis of pyogenic granuloma associated with bullous impetigo.

Case Discussion

Bullous impetigo most frequently occurs in children and immunosuppressed patients; however, it can also present in the general population [2]. Staphylococcal scalded skin syndrome is a more generalized variant of the same process. In both diseases, bullae form as a result of exfoliative toxin type A and type B, which are trypsin-like serine proteases, that target desmoglein 1. When desmoglein 1 is cleaved, there is acantholysis in the granular layer and a blister forms in the upper epidermis [3]. Similar to our patient, the blister cavity and the upper layers of epidermis may contain neutrophils.

Pyogenic granuloma appear as angiomatous papulonodule. It can present on either cutaneous or mucosal epithelium and is usually associated with a history of trauma [4]. The vascular nature of the frequently painful tumor often results in bleeding.

Skin changes in pregnancy can be categorized as physiological, gestation-associated, or incidental (such as bacterial infections and pyogenic granuloma) [5]. In pregnancy, increased levels of estrogen, combined with additional complex physiologic and immunologic changes, can alter the incidence and type of skin conditions [6]. For example, increased estrogen levels significantly affect the oral and vulvovaginal mucosa. The most frequently diagnosed oral mucosal lesions in pregnancy are gingival hyperemia and edema, gingivitis and pyogenic granuloma [7-9].

Pyogenic granuloma of pregnancy is also known as granuloma gravidarum, epulis of pregnancy or pregnancy tumor. Prevalence of pyogenic granuloma ranges from 0.2% to 9.6% in pregnant women. It frequently develops in early to mid-gestation, between month 2 to month 5 of pregnancy [8, 10]. Our patient's tumor appeared during her third trimester.

Placental cytokines cause the T helper lymphocyte population to change from predominant type 1 to type 2 cells during pregnancy [11]. This decreases interleukin 12 and gamma interferon, as well as increase interleukins 4 and 10 in order to prevent rejection of the fetus. However, this alteration is also known to increase risk of both autoimmune and infectious skin diseases, such as impetigo, in the mother.

It is important to balance the benefit of treatment to the risk of an adverse event to either mother or fetus or both during pregnancy. Drug profiles should also be carefully considered, not only during gestation, but also for postpartum mothers who wish to breast feed. Antibiotics including azithromycin and cephalosporins do not have any know teratogenic

effects and may be safely used in pregnancy [11].

A recent literature search, utilizing PubMed as the search engine, of "bullous impetigo and pyogenic granuloma" and "pyogenic granuloma, bullous impetigo, and pregnancy" yielded no results. However, given the potential occurrence of both lesions during pregnancy, we suspect that there may be an underreporting in the literature regarding concurrently occurring pyogenic granuloma and bullous impetigo. Yet, to the best of our knowledge, the concurrent appearance of pyogenic granuloma and bullous impetigo in the same lesion in pregnancy has not been previously described.

In our patient, since the lesion was symptomatic, it was treated prior to delivery. Since concurrent infection was initially suspected, antibiotic coverage for S. aureus was initiated and a bacterial culture was ordered for confirmation. After the lesion was removed with an excisional shave biopsy, her wound rapidly healed with complete preservation of the digit's flexion. Albeit uncommon, infection and tumor can co-exist concurrently within the same lesion. Therefore, this possibility should be considered and management should be directed toward both issues.

Although pyogenic granuloma spontaneously resolves, discomfort and bleeding often prompt the clinician to treat as soon as possible. Hence, in our patient, treatment occurred prior to her delivery. Since other conditions can morphologically mimic pyogenic granuloma, it is appropriate to send the specimen from the tissue for pathologic evaluation [12].

Conclusion

Bullous impetigo is an infection associated with S. aureus. Pyogenic granuloma is a benign vascular tumor. Bullous impetigo and pyogenic granuloma typically appear in non-pregnant individuals; however, each may present during gestation. Our patient was pregnant and concurrently developed both bullous impetigo and pyogenic granuloma in the same lesion. When an infected pyogenic granuloma is identified, treatment should target both processes for complete resolution of the lesion.

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