Pyogenic granuloma (PG) or lobular capillary hemangioma is a common acquired proliferative vascular lesion of the skin and mucous membrane that may appear throughout childhood and adulthood. They occur most often on the face and distal extremities as a solitary, red nodule. PG has a pliable surface and bleeds easily. While etiology of PG is unclear, trauma, infections, female sex hormones, viral oncogenes, microscopic arteriovenous anastomosing, and growth factors are considered as etiologic factors.

Certain variants of PG have also shown an association with medications; reports suggest up to 30% of periungual PG are associated with medications but are also seen in association with other chronic dermatoses such as atopic dermatitis and psoriasis.

Disseminated pyogenic granulomas, although rare, have been documented to occur either spontaneously or after trauma such as burns. Certain medications are also implicated, including isotretinoin use in patients with severe nodulocystic acne and the use of granulocyte colony-stimulating factor (G-CSF) in immunodeficient patients.

We presented a patient with multiple PGs developed after third-degree scald burn due to oil, and this is the first report of disseminated PG post-oil burning. We also reviewed the literature and found 25 other cases that mostly caused by milk burning.

2 | CASE REPORT
A 30-year-old woman was referred to our department (Al-Zahra Hospital; Referral Center for Treatment of Skin Diseases). The patient had 60% body surface third-degree burn due to oil 4 weeks before. She was treated using daily dressing with silver sulfadiazine and intravenous antibiotic in a burn care center, and the burned skin in her thigh was successfully repaired with full-thickness skin graft from the left forearm origin. During this period, 24 days after the burn injury, multiple papillomatoses and nodular lesions appeared periphery of the burn site and also around the donor.
site on her forearm (Figure 1). The lesions grew and bled easily.

Laboratory investigation including complete blood count, liver, and renal function tests was within normal range. HIV and human T-lymphotropic virus serology tests were negative. Blood and fresh tissue cultures for Bartonella spp. were negative. Histopathology examination showed hyperkeratosis, dermal edema, intense inflammatory cell infiltration (mostly lymphocytes and plasma cells), and bloody vessel proliferation (Figures 2 and 3).

The pathological features of this biopsy consisted with the clinical diagnosis of PG. Besides conservative treatment such as daily dressing and antibiotic, the excision of the lesions followed by electrosurgery of the base under local anesthesia was planned for her treatment and performed in the primary local facility. There was no evidence of recurrence 6 months later.

3 | DISCUSSION

PG is a common acquired vascular tumor that is more common in the pediatric age group. The lesions present as rapidly growing papulonodules that are extremely friable, frequently ulcerate, and may bleed profusely with minor trauma. They appear mostly on the face, trunk, and distal extremities. While the etiology of PG remains unclear, the possible predisposing factors that affect the pathogenesis include trauma, infections, elevated female sex hormones level, viral oncogenesis, microscopic arteries venous anastomosis, growth factors, and drugs.1-5 Studies investigating specific angiogenic factors and signal transduction pathways have yet to implicate a single pathway for the pathogenesis of the lesion.

PG of different sizes occurs often as single lesions, and multiple disseminated lesions are rare form of PG, and in general, burns and widespread traumas may play a role in this form of PG. PG develops over the burned area within 1-4 weeks following burns and may be infected with bacteria and fungi. As in other cases in the literature, there were 25 cases of disseminated PG following burn from 1978 to 2020.4,10-23

The cases occurred approximately between 1 and 4 weeks following burning secondary to milk (nine cases), nine cases of scald burn, one case provoked by hot water, and four thermal burns or flames and two cases are not mentioned. Surprisingly, in our patient, the etiology was oil. In a majority of cases, the lesions developed following the second-degree burn. As in our patient, conservative treatment or surgical excision was planned for them (Table 1).

Differential diagnosis includes amelanotic melanoma, squamous cell carcinoma, angiosarcoma, Kaposi sarcoma, hemangioma, bacillary angiomatosis, metastatic visceral malignancies, and granulation tissue.19 The entities were
ruled out both by clinical findings, histopathologic studies, and/or microbiological cultures. Conservative treatment including wound management and antibiotic could be chosen first, especially when large PG is on the face or other important areas of the body. As PG can involve the reticular dermis, pulse dye lasers, cauterization, and shave excision may not be able to reach the entire PG, and these methods of treatment have a recurrence rate of 43.5%. In our patient, the lesions were surgically excised followed by electrosurgery of the base, and no occurrence was observed during 6 months.

On a basic scale level, we think that the burn etiology and not the burn injury itself is important because all similar cases have the same etiology that may not be a coincidence, and milk proteins might cause the development of PG; Surprisingly, most reported cases due to milk are from Iran, Turkey and the habit of boiling raw milk at home instead of using pasteurized milk in urban areas may play a role. In our patient, the lesions were surgically excised followed by electrosurgery of the base, and no occurrence was observed during 6 months.

| Age/ sex       | Causing agent | Degree of burn | Treatment                      |
|----------------|---------------|----------------|-------------------------------|
| 15 months/F    | Boiling milk  | Second         | Electrocoagulation            |
| 1-5 years/M    | Boiling milk  | Second         | Spontaneously resolved/       |
| 5 years/F      |               |                | Electrocoagulation in one     |
| 35 years/F     |               |                | case                         |
| 18 months/F    | Boiling Milk  | Second         | Surgical excision            |
| 41 years/M     | Scald         | Second         | Conservative                 |
| 19 years/M     |               |                |                               |
| 5 years/F      | Not mentioned | Second         | Surgical excision            |
| 2 years/M      | Boiling milk  | Second         | Surgical excision            |
| 8 months/ M    | Thermal burn  | Second         | Self-healing                 |
| 13 months/ M   |               |                |                               |
| 13 years/M     |               |                |                               |
| 17 months/M    | Hot water     | Second         | Oral erythromycin            |
| 8 years/M      | flame         | Second         | Surgical excision            |
| 42 years/F     | Not mentioned | Second         | Surgical excision            |
| 18 months/F    | Hot milk      | Second         | Surgical excision            |
| 7 years/M      |               |                |                               |
| Five cases ranging from 15 months to 4 years | Scalding burn | second | Conservative/nonsurgical |
| 12 years/M     | Boiling milk  | second         | Failed to follow-up          |
| 4 years/F      | Scalding burn | second         | Conservative(Chinese herbal medicine) |
| 15 months/F    | Scalding burn | second         | Conservative(herbal treatment) |
ETHICAL APPROVAL
Enrolled patients provided written informed consent.

DATA AVAILABILITY STATEMENT
The data will be archived and will be available upon request after publication.

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REFERENCES
1. Patrice SJ, Wiss K, Mulliken JB. Pyogenic granuloma (lobular capillary hemangioma): A clinicopathologic study of 178 cases. Pediatric Dermatol. 1991;8:267-276.
2. Kapadia SB, Hefner DK. Pitfalls in the histopathologic-diagnosis of pyogenic granuloma. Eur Arch Otorhinolaryngol. 1992;249:195-200.
3. Kirschner RE, Low DW. Treatment of pyogenic granuloma by shave excision and laser photoablation. Plast Reconstr Surg. 1999;104:1346-1349.
4. Ceyhan AM, Basak PY, Akkaya VB, Yildirim M. Kapucuoglu NA. A case of multiple, eruptive pyogenic granuloma developed on a region of the burned skin: Can erythromycin be a treatment option? J Burn Care Res. 2007;28:754-757.
5. Alessandrini A, Bruni F, Starace M, Piraccini BM. Periungual Pyogenic Granuloma: The Importance of the Medical History. Skin Appendage Disord. 2016;1(4):175-178.
6. Zaiac MN, Walker A. Nail abnormalities associated with systemic pathologies. Clin. Dermatol. 2013;31(5):627-649.
7. Benedetto C, Crasto D, Ettefagl L, Nami N. Development of Periungual Pyogenic Granuloma with Associated Paronychia Following Isotretinoin Therapy: A Case Report and a Review of the Literature. J Clin Aesthet Dermatol. 2019;12(4):32-36.
8. Lenczowski JM, Cassarino DS, Jain A, Turner ML. Disseminated vascular papules in an immunodeficient patient being treated with granulocyte colony-stimulating factor. J Am Acad Dermatol. 2003;49(1):105-108.
9. Sarwal P, Lapumnuaypol K. Pyogenic Granuloma (Lobular Capillary Hemangioma) [Updated 2020 Aug 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK556077/
10. de Kaminsky AR, Otero AC, Kaminsky CA, et al. Multiple disseminated pyogenic granuloma. Br J Dermatol. 1978;98(4):461-464.
11. Momeni AZ, Enshaieh S, Sodifi M, Aminjavaheriz. Multiple giant disseminated pyogenic granuloma in three patients burned by boiling milk. Int J Dermatol. 1995;34(10):707-710.
12. Ceyhan M, Erdem G, Kotiloğlu E, et al. Pyogenic granuloma with multiple dissemination in a burn lesion. Pediatr Dermatol. 1997;14(3):213-215.
13. Liao WJ, Fan FS, Pan M, Gao TW, Liu YF, Ikeda S. Clinicopathological and ultrastructural study of multiple lobular capillary hemangioma after scalding. Dermatol. 2006;213(1):34-36.
14. Aliağaoglu C, Bakan V, Atasoy M, Toker S. Pyogenic granuloma with multiple and satellite involvement after a burn in a 5-year-old child. J Dermatol. 2006;33:150-152.
15. Bozkurt M, Külachi Y, Zor F, Aşkar I. Multiple giant disseminated pyogenic granuloma in a burn lesion. J Burn Care Res. 2006;27(2):247-249.
16. Diallo M, Niang SO, Kane A, Dieng M, Ndiaye B. Pyogenic granulomas with multiple satellites spontaneously resolved. Nouv Dermatol. 2006;25:701-703.
17. Ozbayoglu AC, Aksungur E, Senem A. Pyogenic granuloma developed in a healed flame burn area and review of the literature: Case report. Turk Plast Surg. 2011;19:27-29.
18. Shirol SS, Nimbaragi G, Choukimath SM, Yenni VV. Lobular capillary hemangioma in a post-burn scar. Eur J Plast Surg. 2013;36:323-326.
19. Durgun M, Selçuk CT, Ozalp B, Aydinol M, Alabalik U. Multiple disseminated pyogenic granuloma after second degree scald burn: a rare two case. Int J Burns Trauma. 2013;3(2):125-129.
20. Zhao H, Zhao H, Zhang C, Fu X. Multiple pyogenic granulomas after burns: Response to conservative treatment in five children. Pediatr Dermatol. 2015;32:e175-e176.
21. Dastgheib L, Maghami Z, Aslani FS. Infantile multiple large pyogenic granuloma on burned skin. Case report and review of literature. An Bras Dermatol. 2016;91(2):212-214.
22. Xu Y, Li H, Wang ZX, Yang S. Multiple Eruptive Pyogenic Granulomas Occurring in a Region of Scalded Skin. Pediatr Dermatol. 2016;33(1):e27-e28.
23. Ashk Torab T, Tahereh A, Camelia R. Disseminated pyogenic granuloma without surgical intervention: a case report. J Pediatr Dermatol. 2015;34(10):707-710.
24. Yuan K, Wing LY, Lin MT. Pathogenetic roles of angiogenic factors in the pathogenesis of pyogenic granulomas in pregnancy are modulated by female sex hormones. J Periodontol. 2002;73:701-708.