

Topical treatment of pyogenic granulomas in a pediatric population: A single-institution retrospective review



To the Editor: Pyogenic granulomas (PG) are common benign vascular proliferations of the skin and mucous membranes. Because of their propensity to grow and bleed, surgical management is favored, but it can be costly, traumatic, result in scarring, or require an in-office or operative suite setting. Noninvasive treatment modalities include topical beta-blockers,¹ imiquimod,² and corticosteroids.³ By promoting vasoconstriction and downregulating proangiogenic factors such as vascular endothelial growth factor A, matrix metalloproteinase 1, and interleukin 6, topical corticosteroids potentially target several key pathways implicated in the PG pathogenesis.^{4,5} Here, we expand the limited data supporting the use and efficacy of high potency topical corticosteroids for the treatment of PG and analyze the use of topical and procedural interventions.

Following IRB approval, data were collected retrospectively using the *International Statistical Classification of Diseases, Tenth Revision* code L98.0 for patients diagnosed with PG at the Boston Children's Hospital from January 1, 2019, to September 13, 2021. Cases with incongruent biopsy results or without follow-up were excluded. Data including demographics, treatment, complications, clinical characteristics, and outcomes were recorded. Statistical analyses were completed using STATA. Statistical significance was set to $P < .05$.

Ninety-eight patients were included (mean age, 9.8 years; range, 0.5-22 years) (Table I). Sixty-three patients were managed surgically; 50 with in-office shave removal plus electrocautery and 13 with excision. Regrowth occurred after shave removal in 4 patients and 1 patient on filgrastim (with >50 eruptive PG) after excision (Table II). Surgical site infection occurred in 1 patient; 4 patients followed up with concerns about their scar after the procedure.

Thirty-five patients were treated noninvasively; 31 on initial presentation and 4 after initial procedural intervention. Patients who were managed topically were younger ($P = .013$), and their PG

size was smaller ($P = .006$) (Table II). Fourteen patients received a class I topical corticosteroid (clobetasol [86%], halobetasol [7%], and betamethasone [7%]) alone, applied twice daily under occlusion for a median of 5 weeks (range, 5 days-2 years). Sixteen patients received topical timolol (0.5% ophthalmic gel-forming solution) alone for a median of 6 weeks (range, 8 days-1.6 years). Partial or complete resolution with topical timolol or topical corticosteroid was 50%. Patients managed with topical corticosteroid versus topical timolol underwent subsequent excision in 43% and 56% of cases, respectively ($P = .464$). Five patients were treated with both topical modalities (Table II). Lesions ≤ 4 mm responded favorably to the topical therapy. No adverse effects of topical therapy were reported.

There are no standard guidelines for the management of PG. However, both topical corticosteroids and timolol have excellent safety profiles and are widely used for numerous pediatric skin conditions. Noninvasive management may be favored for younger patients, poor surgical candidates, those with eruptive lesions, or those with small lesions in cosmetically sensitive areas. The COVID-19 pandemic exacerbated barriers in access to care and minimized in-person appointments for many specialties; thus, topical treatment may benefit patients with limited access to live care or those awaiting procedural intervention. Additionally, topical treatment is less suitable for actively bleeding PG, lesions with unclear diagnosis, or patients seeking a rapid cure. Patients and parents should be counseled that topical therapy may not work, and that they may elect to pursue excision later.

Topical treatment may be continued as long as improvement is noted; if PG fails to improve, or if adverse effects are noted, an alternative topical agent or procedure may be pursued. Lesions that exhibit concerning features should be evaluated and may require a biopsy as infectious, malignant, or other vasoproliferative lesions remain on the differential. In this study, patients were not randomized to treatment modalities; thus, the success of the topical treatment is impacted by selection bias whereby experienced clinicians selected patients most amenable to the topical treatment. Although limited by its retrospective design, small sample size, and the use of a single center, our study supports a potential role for the topical management of PG.

Table I. Patient demographics and pyogenic granuloma characteristics

Patient demographics	Total (N = 98)	Surgically managed (N = 63)	Topically managed (N = 35)	P value*
Female, n (%)	33 (34%)	23 (37%)	10 (29%)	.635
Male, n (%)	65 (66%)	40 (63%)	25 (71%)	.635
Age, mean (median), range, y	9.8 (11), 0.5-22	10.9 (12), 1-22	8.0 (5), 0.5-22	.013
History of immunosuppression, n (%) [†]	11 (11%)	7 (11%)	4 (11%)	.962
PG characteristics				
Duration of lesion before presentation, mean (median), d	123 (60)	90 (60)	149 (60)	.0863
History of bleeding/ulceration, n (%)	79 (80%)	53 (84%)	26 (74%)	.238
History of known local trauma, n (%)	6 (6%)	4 (6%)	2 (6%)	.900
Size, mean (median) ± SD, mm [‡]	5.3 (5) ± 3.7	6.3 (6) ± 4.1	3.7 (4) ± 1.8	.0006
PG Distribution, n (%) [§]				
Head and neck	67 (68%)	40 (63%)	27 (77%)	.164
Trunk	21 (21%)	15 (24%)	6 (17%)	.204
Upper extremity	6 (6%)	3 (5%)	3 (9%)	.451
Lower extremity	7 (7%)	4 (6%)	3 (9%)	.682

PG, Pyogenic granuloma.

*Two-sided t test was performed for continuous variables and χ^2 test for categorical variables. Significance was set at $P < .05$.

[†]Intrinsic or secondary to systemic medical therapy.

[‡]N = 79.

[§]For patients with >1 lesion, each area of involvement was counted individually.

Table II. Patient demographics, pyogenic granuloma characteristics, and clinical outcomes by treatment modality

Treatment	Shave removal + electrocautery	Excision	Topical timolol alone	Topical corticosteroid alone	Topical timolol + topical corticosteroid*
N (% of total)	50 (51)	13 (13)	16 (16)	14 (14)	5 (5)
Age, mean (median), y	11.4 (12)	9 (9)	8 (5)	9.7 (7.5)	3 (2)
PG size, mean (median), mm	6.2 (6)	6.6 (6)	3.5 (3)	3.9 (4)	4.75 (4)
Resolution/regression, n (%)	46 (92)	12 (92)	8 (50)	7 (50)	3 (60)
No change/regrowth, n (%)	4 (8)	1 (8)	8 (50)	7 (50)	2 (40)
Subsequent excision pursued, n (%)	1 (0.5)	0 (0)	9 (56)	6 (43)	3 (60)
Median duration of treatment, wk	N/A	N/A	6	5	5

PG, Pyogenic granuloma.

*Treated with both modalities either simultaneously or sequentially.

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Conflicts of interest

None disclosed.

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