

## Facial Hemangioma Treated with Serial Intralesional Corticosteroid Injection: One Year Follow-up

Arya Tjipta, Najatullah  
Semarang, Indonesia.

**Background:** Hemangioma is the most common tumors of childhood, affecting 5 to 10 percent of infants. They have a predilection for the head and neck region. Although having a somewhat predictable natural history evidenced by periods of proliferation, plateau, and involution; the timing of these distinct stages, the presence of complications, and the response to therapy are best characterized as unpredictable. Corticosteroids have been a component of the medical treatment for hemangiomas for over a half century. Intralesional injections purportedly localize the steroid effect to the given lesion and minimize unwanted systemic actions.

**Patient and Method :** We report six patients with facial hemangioma, who required intralesional corticosteroid injection therapy. The number of corticosteroid injections given varied from 2-5 times at an interval of three weeks. The dosage given was 3-5 mg/kg/injection.

**Results :** In our six cases, we found a significant decrease in bulkiness. And in three of our cases, patients were able to open their eyes on their own.

**Summary :** The intralesional corticosteroid therapy was proven to be effective in our case-series.

**Keywords :** hemangioma, corticosteroid, intralesional

**Pendahuluan:** Hemangioma adalah tumor yang paling sering ditemui pada anak, yakni sebesar 5-10% populasi anak. Predileksinya terutama di regio kepala dan leher. Meskipun perjalanan penyakit ini secara alami dapat diprediksi karena melibatkan periode proliferasi, plateau dan involusi, namun pembagian waktu yang jelas antara periode-periode tersebut, komplikasi yang mungkin terjadi dan respons terhadap terapi tidak dapat diprediksi. Kortikosteroid merupakan salah satu pilihan terapi medikamentosa untuk hemangioma sejak lebih dari setengah abad yang lalu. Injeksi intralesi bertujuan untuk mendapatkan efek steroid lokal pada lesi dan meminimalisasi efek sistemik yang tidak diinginkan.

**Pasien dan Metodologi:** Kami melaporkan 6 pasien dengan hemangioma di wajah, yang mendapatkan terapi kortikosteroid intralesi. Injeksi kortikosteroid diulang 2 – 5 kali dengan interval 3 minggu dengan dosis 3 – 5 mg/kg/kali.

**Hasil :** Ukuran massa hemangioma mengecil pada keenam kasus. Bahkan pada 3 kasus, pasien menjadi dapat membuka mata mereka sendiri.

**Ringkasan:** Terapi dengan menggunakan kortikosteroid intralesi terbukti efektif pada serial kasus kami.

**H**emangiomas are the most common tumors of childhood, affecting 5 to 10 percent of infants. They have a predilection for the head and neck region, affect girls more than boys, are seen in premature infants more than in full-term infants, and are present in Caucasians more than in other ethnicities.<sup>1,2</sup> These benign tumors have a classic histologic appearance, with plump, proliferative endothelial cells, and often have GLUT-1 positivity. Although having a somewhat predictable natural history evidenced by periods of proliferation, plateau, and involution; the timing of these distinct stages, the presence of complications, and the response to therapy are best characterized as

unpredictable. Until recently, however, classification schemes based on historical phenotypic observations often complicate diagnosis and proper medical management.<sup>1</sup>

Corticosteroids have been a component of the medical treatment for hemangiomas for over a half century. Since the initial observation of accelerated healing in an infant with a large hemangioma, numerous reports have looked at the use of corticosteroids as the primary medical treatment in infants and children with hemangiomas. Local as well as large, life-threatening hemangiomas can be treated with corticosteroid, as lesions responsive to this modality often display arrested growth or accelerated regression within the first week of

*From Division Of Plastic Surgery, Department of Surgery, Kariadi General Hospital, Semarang, Indonesia Presented in 15th IAPS Scientific Meetings In Semarang, Central Java, Indonesia*

**Disclosure:** The authors have no financial interest to declare in relation to the content of this article.



treatment. A review of this literature, however, reveals an inconsistent response to corticosteroid therapy. It has been proposed that only 30 percent of patients were clear responders with expeditious regression, whereas another 30 percent were clear nonresponders. Yet, the relative safety and ease of corticosteroid use continues to make them an attractive and well-accepted first-line therapy.<sup>4</sup> Intralesional injections purportedly localize the steroid effect to the given lesion and minimize unwanted systemic actions.

### PATIENT AND METHODS

Patients with hemangioma involving the facial areas, where the excision of hemangioma (e.g. the hemangioma involving lip and eyelids) was not possible and where the excision carried

a risk of disfigurement, were given alternative of interlesional corticosteroid injections. The number of corticosteroid injections given varied from 2 – 5 times at an interval of three weeks. The dosage given was 3 – 5 mg/kg/injection.

From January 2009 until August 2010, six patients with hemangioma involving the facial area were seen in the outpatient clinic in Kariadi General Hospital, Semarang. Treatment plans were recommended based on size, location, and problems the patient was experiencing. Final results for each patient were also determined. The result was determined based on change in volume of hemangioma, improvement in color, and improvement in texture. All patients were followed-up for 1 year.

**Table 1.** Cases

No	Age	Sex	Anatomic Location	No of Injections	Results
1	1 y.o	F	Labium oris inferior, left buccal, temporal, and neck.	5 times	Reduction in size and color improvement (Fig.1)
2	7 m.o	F	Right buccal region and right ear lobe	5 times	Reduction in size and color improvement (Fig.2)
3	8 m.o	F	Superior & inferior palpebral, temporal, and left buccal	6 times	Significant decrease in size and color improvement (Fig.3)
4	8 m.o	M	Superior and inferior palpebra, and temporal	3 times	Significant reduction of hemangioma mass on the palpebra, and patient was able to open his eyes (Fig.4)
5	5 m.o	F	Labium oris superior	3 times	Reduction in size (Fig.5)
6	5 m.o	F	Superior & inferior palpebra, and temporal	2 times	Significant reduction of hemangioma mass on the palpebra, and patient was able to open her eyes slightly (Fig.6)

F = Female; Fig = figure; M = Male; m.o = months old; No. = number; y.o = years old



**Figure 1.** A 1-year-old girl with mixed hemangioma at the region of *labium oris inferior*, *left buccal* region, *temporal*, and *neck*. One year follow-up after treatment.



**Figure 2.** A 7-month-old girl with mixed type hemangioma of the right buccal region and right ear lobe. One year follow-up after treatment shows a reduction in size and color improvement.



**Figure 3.** An 8-month-old girl with complete involuting hemangioma of the superior, inferior palpebral, temporal region, and left buccal.



**Figure 4.** An 8-month-old boy with complete involuting hemangioma of the superior, inferior palpebral, and temporal region.

## DISCUSSION

A conservative approach to hemangiomas has prevailed for decades. Margileth and Museles compared two groups, one that was actively treated (surgery or radiation) and one that was managed conservatively without intervention.<sup>8,9</sup> The complication rates were 56% and 5%, respectively. After more than a decade of treating hemangiomas, we undertook this review to evaluate our treatments.<sup>9</sup>

Physical factors such as location, depth of lesion, and presence or likelihood of complications are all immediately identifiable parameters that can serve as the basis for a

treatment decision. However, the psychosocial impact of the hemangioma to both the child and child's parents or caregivers should not be discounted as the course of management is developed.<sup>9,10</sup> Although infants or young children may not be troubled by the presence of a lesion, the impact on close adults or on the child as he or she reaches school age may invoke adverse psychosocial distress.<sup>3</sup>

Ultimately, the natural course for most hemangiomas is involution followed by full resolution, supporting a traditional observational approach. Therefore, any decision to treat the hemangioma in an infant or child needs to be directed by assessing the reason for treatment as well as the goals for the choice of



**Figure 5.** A 5 months old girl following with hemangioma of the labium oris superior.



**Figure 6.** A 5 months old girl following with complete involuting hemangioma of the superior, inferior palpebrae, and in temporal region (left pic). After 1 year follow up, she was able to open her eyes slightly (right pic).

management. Based on clinical judgment, every hemangiomas patients can be treated with one of the following therapy: I. observation ; II. steroid treatment (systemic and/or intralesional); III. excision and reconstruction; IV. laser therapy ; V, combined therapy.<sup>8</sup> Goals for treatment are based on 3 defining principals: (1) minimizing physical complications leading to morbidity and mortality, (2) alleviating any pending or potential psychosocial conflict in the patient or patient’s family, and (3) avoiding overly aggressive procedures with a potential for toxic side effects or undue scarring in hemangiomas with a high probability for excellent prognosis without therapy.<sup>8,9</sup>

Zarem and Edgerton found that systemic corticosteroids rapidly induced involution in massive hemangiomas. Subsequent reports by many authors have confirmed the efficacy of prednisone and prednisolone in dosages of 2 – 3 mg/kg of body weight. In principle, the lowest dose administered for the shortest time is preferred. Mulliken suggests an initial 2-week course of therapy, which, if successful, should be continued and slowly tapered over several months. Therapy is slowly tapered over several months to prevent adrenal insufficiency. A clinical response is usually seen within 7 to 10 days of beginning treatment. Because the majority of hemangiomas begin to involute at 10 to 12 months, treatment usually can be discontinued before 1 year of age.<sup>9</sup>

Historical response rates for oral corticosteroid therapy vary from 30 to 90 percent, but many of these studies included other types of vascular lesions. The response rate for true hemangiomas to corticosteroids is closer to 90 percent. In lesions that respond, rebound growth may occur with tapering or discontinuing and reinstitution of therapy may be warranted. Adverse effects are frequent but are minor and temporary.<sup>5</sup>

Generally, corticosteroids are well tolerated at doses up to 5 mg/kg. Many clinicians will use local injection with a periorbital or small (Ø 2.5 cm) isolated hemangioma, and the use of systemic oral corticosteroids is reserved for large or potentially disfiguring and life-threatening hemangiomas. This regimen varies, however, as proponents of systemic corticosteroid feel that local injections, even with small isolated hemangiomas, can increase residual scarring. For local therapy, a series of 3 – 5 corticosteroid injections are given at 3 to 5 mg/kg per injection over 6-8-week intervals.<sup>4,5</sup> There is also reports of intralesional corticosteroid injections given as frequent as daily at 2 mg/kg for the first 2 weeks followed by 1 mg/kg daily for the following weeks, has satisfactory results and proven to be safe.<sup>10</sup>

The accelerated involution of multiple lesions when one was injected (e.g., as seen in photographs in Kushner’s original article), the documented cases of adrenal suppression and cushingoid facies in up to 10 percent of cases

following intralesional injection, are evidence of systemic effects. Severe complications related to intralesional injection of periorbital hemangiomas have also been described, including blindness, globe penetration, eyelid necrosis, and soft-tissue atrophy.<sup>5,9</sup>

### SUMMARY

The intralesional corticosteroid therapy was proven to be effective in our case-series. Following are the major advantages of this mode of treatment: no surgery, no scarring, there is no growth disorder, it is cost effective and can be administered without anesthesia or as day care surgery if general anesthesia is required, and there is very low incidence of complications. The down side in our case series was there were still residual mass in 1-year follow up and the aesthetic appearance even though already had major improvement but were still not satisfactory.

**Najatullah, M.D.**

*Plastic Surgery Division, Department of Surgery,  
Kariadi General Hospital  
Semarang, Indonesia  
najatullahspbp@gmail.com*

### REFERENCES

1. Mulliken JB, Fishman SJ, Burrows PE. Vascular anomalies. *Curr Prob Surg.* 2000; 37: 517..
2. Berenguer B, Mulliken JB, Enjolras O, et al. Rapidly involuting congenital hemangioma: clinical and histopathologic features. *Pediatr Dev Pathol.* 2003; 6: 495.
3. Mulliken JB. Vascular anomalies. In: Thorne CH et al. Grabb and Smith's Plastic Surgery. 6 ed. Philadelphia: Lippincott Williams & Wilkins; 2007.
4. Boon LM, MacDonald DM, Mulliken JB. Complications of systemic corticosteroid therapy for problematic hemangioma. *Plast Reconstr Surg.* 1999; 104: 1616.
5. Berenguer B, Burrows PE, Zurakowski D, et al. Sclerotherapy of craniofacial venous malformations: complications and outcome. *Plast Reconstr Surg.* 1999; 104: 1.
6. Mishra A, Holmes WJM, Gorst MC, Liew SH. Role of propranolol in the management of periocular hemangiomas. *Plast Reconstr Surg.* 2010; 126: 2.
7. Arneja JS, Pappas PN, et al. Management of complicated facial hemangiomas with  $\beta$ -blocker (propranolol) therapy. *Plast Reconstr Surg.* 2010; 126: 3.
8. Gampper TJ, Morgan RF. Vascular anomalies: hemangioma. *Plast Reconstr Surg.* 2002; 110: 572.
9. Beck DO, Gosain AK. The presentation and management of hemangiomas. *Plast Reconstr Surg.* 2009; 123: 6.
10. Mattassi R, Loose DA, Vaghi E. Hemangiomas and vascular malformations. New York: Springer; 2009.