

Tufted Angioma : Clinicopathologic Surveys and the Response to Intralesional Steroid

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Background : Tufted angioma is an uncommon slowly progressive vascular tumor found typically in infants and young children with characteristic histologic findings, so called "cannonball" appearance.

Objective : The purpose of this study was aimed to investigate the clinical and histopathological characteristics of tufted angioma and the response to intralesional steroid.

Methods : Clinical information of 10 patients with tufted angioma diagnosed in Severance hospital and Pundang CHA hospital from 1983 to 1999 was obtained from the medical records and clinical follow-ups. We re-evaluated 10 biopsy specimens obtained from them with routine H&E staining.

Results : Five male and five female patients were included. In 9 patients the lesion appeared before 2 months of age. Four had a lesion at birth. The thigh was the most common site. The clinical symptoms were diverse, but characteristically tenderness was present in most cases. In all the patients the lesions had a tendency to spread progressively. Microscopically, numerous, distinct, variably sized, tightly packed capillary and endothelial cellular lobules were scattered in the dermis. There were characteristic semilunar spaces adjacent to the capillary tufts. Six patients received intralesional triamcinolone. This treatment was found to be effective in 5 patients who experienced remarkable improvement. The improved cases had similar histologic findings which were composed of cellular mass more than lumen formation. We classified our specimens into two categories, one with more cellular mass and the other with more lumen formation in relative proportion. The former was different from the latter in that it had more solid appearance and more definite margin. And we realized that it was useful to divide into these two categories since its response to treatment could be different.

Conclusions : Tufted angioma is a relatively uncommon disease with characteristic histopathologic findings. It seems not to regress spontaneously. So early treatment is required to prevent further spreading up to the extent. We treated 6 patients with intralesional injection of triamcinolone and 5 patients experienced marked improvement which had more cellular mass more than lumen formation histopathologically. (Ann Dermatol 14(1) 22-27, 2002).

Key Words : Tufted angioma, Intralesional steroid

Tufted angioma is an uncommon slowly progressive vascular tumor found typically in infants and young children, and sometimes

since birth or in young adulthood. Because of the characteristic histologic findings of small, well-defined, tightly packed capillary lobules scattered in the dermis, so called "cannonball" appearance, the lesions were designated as tufted angioma. Synonyms are progressive capillary hemangioma and Nakagawa's angioblastoma. Even though tufted angiomas progressively enlarge frequently to a large size measured 10 centimeter or more in diameter,

Received June 27, 2001.

Accepted for publication June 27, 2001.

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they appear to be benign. Malignant transformation has not been reported in tufted angioma. Unlike other hemangiomas, tenderness is a very common feature. It was not until recently that we realized tufted angioma as a distinct entity of disease. Since angioblastoma was first described as a variant of hemangioma by Nakagawa in 1949¹, it has been reported only in Japan. Tufted angioma was first systematically described in 10 patients by Wilson Jones in 1976 in English literature². Now tufted angioma is frequently mentioned as a separate disease, particularly because of the advent of Kaposi's sarcoma, which should be differentiated from tufted angioma in AIDS³. Tufted angiomas tend not to regress spontaneously. In the view of treatment, many approaches were taken such as surgical excision, cryotherapy, dye laser, electrocauterization, steroid or interferon intralesional injection. In this article we report 10 cases with tufted angioma and discuss the response to steroid intralesional injection.

MATERIALS AND METHODS

Clinical information of 10 patients with tufted angioma diagnosed in Severance hospital and Pundang CHA hospital from 1983 to 1999 was obtained from the medical records and clinical follow-ups. Ten formalin-fixed biopsies were available for this study. Routinely prepared sections of paraffin-embedded tissue were stained with H&E in all cases.

RESULTS

1. Clinical observations (Table 1,2)

1) The ratio of females (5 patients) to male (5 patients) was equal in our study.

2) The lesions have appeared before 2 months of age in most patients. Four patients had a lesion at birth and one patient at 12 month-old.

3) The thigh affecting 6 patients was the most common site. Other sites were calf, abdomen, groin, and neck.

4) The clinical symptoms were diverse. Five patients had reddish plaques. In the other patients, the presenting symptoms were erythematous patch, nodule, tumor, and depressed lesion, respectively (Fig. 1-1,1-2).

5) The size of the lesions at the time of diagnosis was various from 1 to 13 cm. One among 10 patients had a giant form in size of 26 cm.

6) The age of the patients at the time of diagnosis was less than 12 months of age in 7 patients. The remaining were 5, 11 and 13 years old, respectively.

7) In all of the patients the lesions shared tendency to grow as time goes by. Regression or spontaneous disappearance was not observed.

8) Tenderness was found in 8 patients. Some lesions were noted to be warm. Increased fine lanugo hairs were noted on lesion in one patient. One lesion showed hyperhidrosis.

9) Familial tendency was not found

2. Histopathological observations (Table 3)

Table 1. Subject profiles

Patient's No	Sex	Age of onset	Site	Size(cm)	Duration of lesion
1	M	1m	Thigh	5×13	1yr
2	M	2m	Thigh	6×12	4ms
3	F	Birth	Thigh	8×26	1yr
4	F	10day	Thigh	3×4	4ms
5	F	Birth	Calf	4×5	11ys
6	F	Birth	Thigh	4×3	2ms
7	M	Birth	Trunk	1×1	4ms
8	M	2m	Thigh	3×3	6ms
9	M	1m	Groin	5×5	3ys
10	F	2m	Neck	3×4	10ys



Fig. 1-1. Erythematous patch affecting on Lt. thigh (Before treatment).
1-2. appearance of skin lesion after 5 months of treatment with triamcinolone.

1) There was no epidermal change.

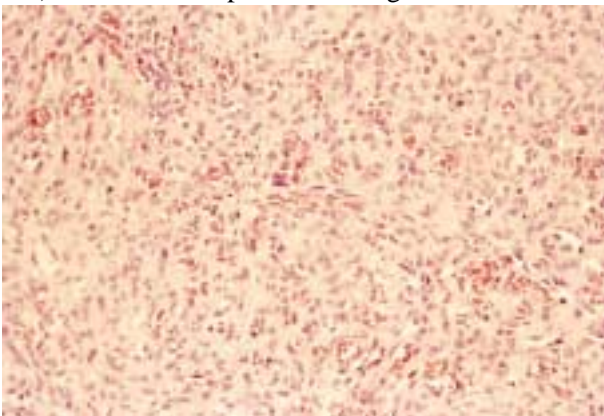


Fig. 2. Endothelial cells with more vascular component.

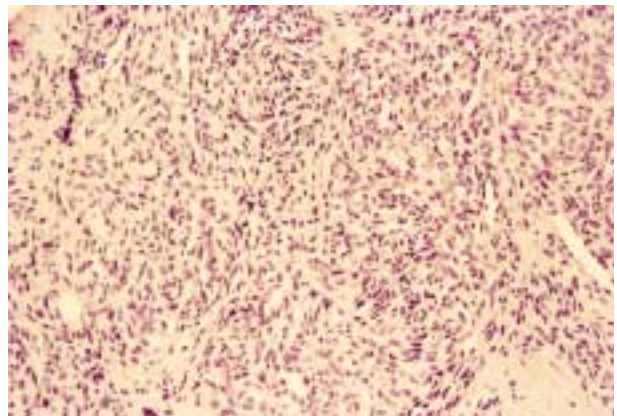


Fig. 3. Endothelial cells with more cellular mass.

2) The numerous, distinct, variably sized vascular and endothelial cellular lobules were scattered at various levels in the dermis. The lesions were also located in the upper portion of panniculus in two specimen.

3) When the relative proportion of cellular mass composed of endothelial cells and lumen formation composed of capillaries were evaluated, 7 patients had the more cellular masses rather than lumen formations. Most lesions of cellular mass showed solid appearance (Fig. 2,3).

4) The lesions of cellular masses had well-defined margins compared with relative poor-

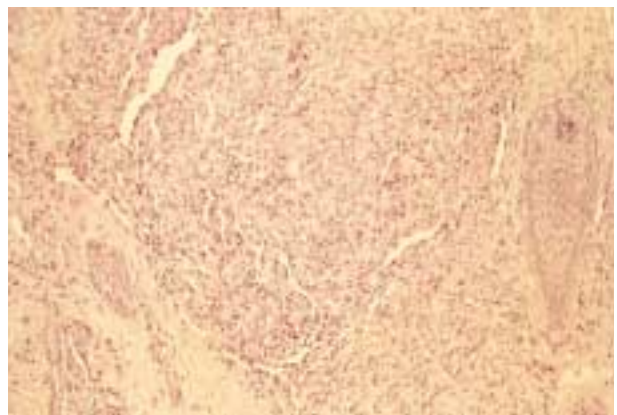


Fig. 4. Characteristic endothelial cellular nodule with peripheral lymphatic-like vascular dilation.

Table 2. Summary of the clinical findings in the cases

Patient No.	Sex	Site	Size	Tenderness	Warm	Sweating	CT scan
1	M	Thigh	5×13	+	-	+	H
2	M	Thigh	6×12	+	+	+	H
3	F	Thigh	8×26	+	-	-	H
4	F	Thigh	3×4	+	+	-	H
5	F	Calf	4×5	+	-	-	N
6	F	Thigh	4×3	+	+	-	N
7	M	Trunk	1×1	+	-	-	H
8	M	Thigh	3×3	+	-	-	N
9	M	Groin	5×5	+	-	-	N
10	F	Neck	3×4	-	-	-	N

H: c/w Hemangioma, N: Not done

Table 3. Summary of the histopathologic findings in the cases.

Case		1	2	3	4	5	6	7	8	9	10
Parameter											
Epidermal change		-	-	-	-	-	-	-	-	-	-
	upper dermis.	-	-	-	-	-	-	-	+	-	+
	mid dermis.	+	+	+	+	+	+	+	+	+	+
Involvement	deep dermis.	+	+	+	+	+	+	+	-	+	+
	Panniculus	+	-	+	+	-	+	-	-	+	+
	(upper)				(upper)						
Cellular mass		+/++	++	++	++	++	++	++	+	+	++
			/+++	/+++	/+++	/+++	/+++	/+++			/+++
Lumen formation		++	+/+++	+/-	+/-	+/-	+/-	+/-	+/+++	+/+++	+/-
		/+++									
Border		ill	well	well	well	well	well/ill	well	ill	ill	well
	Beside mass	-	+	+	++	+	++	+	+	-	+
Dilated lumen											
	Interstitial	+++	+	-	+	-	+	-	+	+	-
Vascular slit		+	+/-	+/+++	+/+++	+	+/+++	+/-	-	-	+
Atypicality of endothelial cells		-	+/-	-	-	-	+/-	-	-	-	-
Association with	Hair follicle	-	-	-	-	-	-	-	-	-	-
	Eccrine duct	-	+	-	-	-	+	-	-	-	-
Infiltration of inflammatory cells		+/+	-	-	+/+	-	+/+	-	+	+/+	-
Interstitial edema		+	+	-	+	-	-	-	+	+	-

* ; located around eccrine gland

defined margins of lesions with lumen formations.

5) In 8 specimens, there were characteristic

semilunar spaces which were interpreted as dilated lymphatic channels. These lymphatic spaces were found mostly adjacent to the

Table 4. Response to triamcinolone ILI and histopathologic findings.

	1	2	3	4	5	6	7	8	9	10
Cellular mass	+/++	++/+++	++/+++	++/+++	++/++++	++/++++	++/+++	+	+	++/+++
Lumen formation	++/+++	+/++	+/-	+/-	+/-	+/-	+/-	+/++	+/++	+/-
Response to T-A ILI	N	I	I	I	-	I	-	-	-	I

T-A: Triamcinolone, I: Improving or improved, N: No effect, -: Not done

capillary tufts(Fig 4).

6) Some vascular slits were found but there was no atypicality of lining endothelial cells.

7) There was no inflammation surrounding the vascular lobules in 5 specimens, and slight inflammation in 5 specimens.

8) Interstitial edema was found only around sweat glands in 4 specimens.

9) The vascular lobules seemed to have no relation with hair follicles, and were found to be connected with sweat glands in 2 specimens.

3. Treatment(Table 4)

1. Six patients received intralesional triamcinolone(amount: 5mg/ml or 10mg/ml per week, duration: 1 month to 6 months). This treatment was found to be effective in that 5 patients experienced remarkable improvement.

2. The improved 5 patients had the lesions composed of cellular mass more than lumen formation. There was no response in one patient with more lumen formation.

DISCUSSION

Angioblastoma was first described as a variant of hemangioma by Nakagawa¹ in 1949. Most reported cases have been found only in Japan. In English literature, McMillan and Champion⁴ seem to regard it as a peculiar variant of nevus flammeus on the basis of its clinical appearance, which they called 'progressive capillary hemangioma'. The term 'tufted angioma' was first introduced by Wilson Jones, who reported 10 patients with a peculiar type of 'acquired angioma', clinically characterized by slowly spreading erythematous macules and plaques and histopathologically characterized by distinctive groups of capillary lobules scattered at various levels in the der-

mis². Nakagawa's angioblastoma has been equated with tufted angioma by several authors and on the other hand, there was controversies about the same identity⁵. Now tufted angioma is accepted to be a distinctive condition that is separate from other types of vascular proliferation. Differential diagnosis include strawberry hemangioma, pyogenic granuloma, eccrine-hemangiomatous hamartoma⁵, Kaposi's sarcoma, angiosarcoma, bacillary angiomatosis⁶ and so on⁷.

Even though the most characteristic findings of tufted angioma lie in histopathology of the dermis, clinically it has also something different from other hemangiomas. The most striking clinical features discriminating this angioma from others are that this lesion grows progressively without tendency for spontaneous regression and patients have tenderness frequently^{3,8-11}. These two features were found in all of the patients included in our study. This lesion most often appeared in infants or young children of either sex. In the majority of Wilson Jones' patients (12 of 20 patients), the angiomas appeared before 5 years of age³. Of these, six occurred in the first year of life, but only three at birth. Sometimes tufted angioma has been found to be associated with other conditions in adults^{7,12}. The angiomas of our patients occurred before 2 months of age in most cases. Of these, four had a lesion at birth. In all the cases except one of tufted angioma reported so far, no familial history has been evident¹³. We did not find familial tendency in our patients. Common sites are upper trunk and neck in previous reports. Face and scalp are known not to be involved and lower extremities is exceptional. However, in our study 8 of 10 patients had the lesions on lower extremities, mostly thigh. The presenting manifestations are slowly growing erythematous

macule, plaque or cluster of papules. Our patients had various presentations which are erythematous patch, plaque, nodule, tumor, and depressed lesion. A depressed lesion was an unusual finding. The lesions varied greatly in size from 1 to 26 cm. Although the pathogenesis of tufted angioma is not understood, the role of endothelium growth factors such as interleukin-8, cytokine, and estrogen⁷ are provided for the formation of tufted angioma¹⁴.

Histopathologic findings of tufted angioma are so characteristic that diagnosis is primarily dependent upon it. It consists of multiple well-defined densely cellular lobules of capillary in the dermis^{3,8-10}. Our patients were diagnosed as tufted angioma on the basis of histopathologic findings too. We classified our specimens into two categories, one with more cellular mass and the other with more lumen formation in relative proportion. The former was different from the latter in that it had more solid appearance and more definite margin. Aside from that, we realized that it was useful to divide into these two categories because response to treatment was clearly different.

Although the clinical course is entirely benign, this angioma is resistant to treatment. Soft X-ray treatment had been recommended¹⁴. But there is no available data to improve with this therapy in other reports. Wilson Jones did not find any satisfactory therapy in spite of several treatments including cryotherapy, x-ray, excision³. We treated our patients with intralesional triamcinolone, getting a hint from a fact that it is effective to capillary hemangioma. The response was better than expected. Of the 6 patients who received intralesional triamcinolone, 5 patients experienced marked improvements. Only one patient did not respond. The interesting fact is that the responsive patients had the lesions with more cellular masses as our pathologic classification. On the other hand an unresponsive patients had the lesions with more lumen formations. It is too early to confirm the effectiveness of intralesional steroid because of the lack of follow-up period. However this is the first article which suggests the intralesional steroid as a effective treatment for tufted angioma and its re-

lation with pathologic findings.

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