Surgery: The Treatment of Choice for Hemangiomas

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ABSTRACT

The management of hemangiomas has always been a matter of controversy. Traditionally, observation has been the mainstay of therapy, with the expectation that most of the lesions will disappear spontaneously. This treatment plan was based on the premise that surgical excision or other treatments might produce a worse result than simply waiting for the lesion to resolve with an acceptable cosmetic result. This plan has been challenged because of a growing number of specialty teams that address these lesions. This article examines various cases of pediatric hemangioma and evaluates the possibility of surgical excision as a first-choice treatment in these cases. One hundred fifteen cases of surgical excision of pediatric hemangiomas performed by a single surgeon over a period of 7 years were examined. Pre- and postoperative photographs were examined. Hemangioma location, size, and type; patient's age; and surgical technique are described. Acceptable cosmetic and functional results were achieved in all surgical cases. Early excision of hemangioma should be the procedure of choice in selected cases of hemangioma. Hemangiomas in areas where a significant cosmetic defect or functional defect might ensue should have surgical excision considered as first-line treatment.

KEYWORDS: Hemangioma, surgical excision, pediatric

The management of hemangiomas has always been a matter of some controversy. To this day, many physicians dismiss the lesions as benign masses that ultimately disappear without leaving a trace.¹ However, as any physician who has cared for some of these problem lesions knows, this is not necessarily true. Patients continue to present with lesions that cause permanent disfigurement after previous reassurances that the lesion would not be problematic. It is becoming increasingly clear that there needs to be a reassessment of how families are counseled regarding treatment of these lesions.

The team approach to hemangioma should, at the least, include pediatric dermatology and plastic surgery

specialists. It is the opinion of the authors that all parents of children with hemangiomas, regardless of size or location, should be offered the option of surgery. Just as with any other lesion, surgical excision is one of the treatment modalities. With respect to hemangiomas in particular, there are many reasons to pursue aggressively a strategy of surgical excision. These are detailed in the following.

RATE OF PROGRESSION

Despite extensive study of these lesions, the rate at which a hemangioma enlarges cannot be predicted.¹

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Dermatology for Plastic Surgeons; Guest Editor, Moise L. Levy, M.D.

Semin Plast Surg 2006;20:163-168. Copyright © 2006 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA. Tel: +1(212) 584-4662.

DOI 10.1055/s-2006-949118. ISSN 1535-2188.

Figure 1 Eyelid hemangioma.

The literature has demonstrated and experience has shown that some hemangiomas enlarge quite rapidly in the first few weeks to months of a child's life.¹ On initial evaluation by the pediatrician, the lesion may be nothing but a small macule that seems fairly innocuous. Within a short period of time these lesions may become so large that they permanently distort critical structures, particularly in the face. This period of enlargement may be so short that the family has a hard time being reevaluated by the pediatrician, dermatologist, or pediatric surgical specialist capable of resection. Failure to offer surgery as an option when the lesion is a manageable size can clearly be interpreted by the family as a failure of the pediatrician to provide information regarding treatment options that has resulted in a substantially compromised outcome for their child. This point of view has been made in the mainstream media and has received much publicity (*New York Times*).²

SIZE AND LESION LOCATION

The location of the hemangioma should weigh heavily in the decision to proceed with surgery. The most problematic anatomic region for these lesions is the face. Aside from the obvious fact that these are the most noticeable lesions, the face presents problems in both function and form with enlarging hemangiomas. This is true for the mouth, nose, and eyes in particular (Figs. 1 and 2).³

Lesions of the eyelid can enlarge to the point that the visual axis is obstructed. In infants less than a year of age, this may rapidly lead to blindness because of the lack of visual sensory input in that eye.^{1,3} This represents a true emergency and demands immediate intervention to prevent this sequela. Although there is a chance that these lesions might shrink spontaneously, there is a strong case for intervening in these lesions when they are much smaller and more manageable.

The nose, as the focal point of the face, presents serious problems with enlarging lesions. The deformity is seen so commonly that it has been given the term the "Cyrano nose" (Fig. 3).⁴

Aside from the obvious problems with appearance, these enlarging lesions can permanently distort the underlying structural elements of the nose. Consequently, even when involution occurs, the shape of the nose is permanently altered, and larger lesions require ultimate surgical intervention to reshape.⁵ Again, early surgical intervention can prevent this.

Finally, the mouth and involvement of the lips with the hemangioma can be problematic. Although usually not a functional problem, as the patients are quiet capable of eating and retaining their secretions

A

B

Figure 2 (A) Large cheek hemangioma. (B) Early surgical intervention, 9 months postoperatively.

Figure 3 (A) Nasal tip hemangioma with associated labial hemangioma. (B) Nasal tip hemangioma with associated labial hemangioma (lateral view).

despite the size of the lesion, the hemangioma may cause permanent enlargement of the upper or lower lip.⁶ Even after involution, wedge resections to resize the lip are necessary. They may also permanently distort the vermillion border, a critical aesthetic component of a normal-appearing lip. This is virtually impossible to recreate with any intervention (Figs. 4–6).

Figure 4 Labial hemangioma with distortion of the upper lip vermillion border.

TIME TO INVOLUTION

One of the most vexing aspects of hemangioma management is our continued failure to understand the rate at which these lesions involute. Despite much study, there is no known way to predict when a hemangioma will resolve.¹ The most frequently cited numbers are that 50% of hemangiomas involute by 5 years of age and 75% by 7 years of age.^{1,7} This is of little consolation to a family with a neonate who has a rapidly enlarging lesion. The mother and father want to know whether their child will be in the 50% in whom involution occurs by age 5. However, even if the lesion is involuted by age 5, the child may still present to school with the lesion. When a lesion is visible, experience has shown this to be a source of a great deal of derision by the child's peers. It is very hard for the child with a hemangioma at this age to explain it to children who are taunting. Studies have demonstrated that such situations can lead to considerable psychological distress in children.⁸ There is simply no reason that this should be the case. As with essentially all other congenital deformities, every effort should be made surgically or otherwise to resolve the deformity prior to the child entering school.⁹

Another critical consideration along these lines is that, even once involuted, many of these lesions leave a residual "scar." This is obviously true when the enlarged lesion has distorted the surrounding structures, but it is

Figure 5 (A) Large labial hemangioma preoperatively. (B) Large labial hemangioma postoperatively.

also true from the standpoint of the overlying skin. Frequently the skin has a wrinkled appearance, much like crepe paper. It is clear that it is abnormal and, in and of itself, presents a visible deformity that often requires surgical revision (Fig. 7).¹

It is incomprehensible to many families that they have waited for many years for a lesion to resolve only to have ultimately the surgery that they were not offered earlier.

DIAGNOSIS

Not all hemangiomas look like hemangiomas (Figs. 8 and 9). Although this statement may seem trite, confusion in diagnosis is not infrequently seen. This may be

due to the time course of the presentation or growth of the lesion. It is seen most frequently in what are termed rapidly involuting congenital hemangiomas. These are lesions that are actually present at birth, having formed in utero.¹⁰ They subsequently involute rapidly. However, because of this unusual presentation, biopsy or excision may be indicated.

Other lesions simply do not look like hemangiomas. In such cases, sarcoma is always a consideration.^{11,12} Failure to make an appropriate diagnosis in a timely fashion may lead to a compromised outcome with progression of the cancer. Again, in these cases, it is frequently simpler to excise the lesion for examination rather than to observe it expectantly.

SURGICAL TECHNIQUE

Surgery for hemangiomas in the first year of life is a technique that has not been reviewed extensively in the literature. It is the general perception that this is perhaps more difficult and dangerous because of the highly vascular nature of these lesions in the neonate.¹ However, just the opposite is true. Operating on hemangiomas in older children is somewhat more problematic than in the neonate. In the involuting lesion, the hemangioma is a mixture of fibrofatty tissue and blood vessels. It is very difficult in many of these lesions to distinguish between the hemangioma and normal tissue. As a consequence, this requires resection of a greater volume of normal tissue.

In the proliferative phase, the rapid growth of the lesion results in the formation of a "pseudocapsule." That is, there is a very clear delineation between the lesion and the surrounding subcutaneous fat. Surgery to excise this can be essentially bloodless if one remains in this plane (Fig. 10). To do so, the incision is made initially just into the normal skin. The electrocautery is then used to dissect through the normal fat to the interface with the lesion. With a gauze exerting traction on the lesion, it can be largely manually removed in this plane.

Figure 6 Disfiguring nasal and labial hemangiomas.

Figure 7 (A, B) Crepe paper-like appearance of involuted hemangiomas.

Usually, one or two sizable feeding vessels are encountered in the dissection. Given their small size in these infants, they are easily cauterized. The resulting scar is simply a matter of the size of the lesion (Fig. 11).

Again, this is part of the rationale for operating early. Early surgery on small lesions results in minimal scarring and is a fairly simple procedure with negligible blood loss. Any delay allowing further enlargement of the lesion may lead to increased blood loss and a large scar.

Figure 8 Rapidly involuting cavernous hemangioma.

Figure 9 Chest wall hemangioma.

Figure 10 Surgical excision of hemangioma by remaining within the subcutaneous tissue plane.

Figure 11 Postoperative view of excised labial hemangioma.

DISCUSSION

In conclusion, we feel that surgery has been substantially underutilized as a treatment for hemangiomas in infants. Furthermore, families have historically been relatively uninformed of this as an option in the treatment of their child. When one considers all of the preceding reasons for early surgical intervention, failure to offer this option to the family is a problem for the consulting physician. As our population of patients becomes increasingly informed through many sources including the Internet, there needs to be a complete discussion of all options available in the treatment of these problem lesions.

REFERENCES

1. Marler JJ, Mulliken JB. Current management of hemangiomas and vascular malformations. *Clin Plast Surg* 2005;32:99-116
2. Braiker B. "Doctors Re-examine 'Strawberry Marks' in Babies," *New York Times*, December 20, 2005, sec F, p 6.
3. Buckmiller LM. Update on hemangiomas and vascular malformations. *Curr Opin Otolaryngol Head Neck Surg* 2004;12:476-487
4. Thomson HG, Lanigan M. The Cyrano nose: a clinical review of hemangiomas of the nasal tip. *Plast Reconstr Surg* 1979;63:155-160
5. Pitanguy I, Machado BH, Radwanski HN, Amorim NF. Surgical treatment of hemangiomas of the nose. *Ann Plast Surg* 1996;36:586-592
6. Van Doorne L, De Maeseneer M, Stricker C, Vanrensbergen R, Stricker M. Diagnosis and treatment of vascular lesions of the lip. *Br J Oral Maxillofac Surg* 2002;40:497-503
7. Van Aalst JA, Bhuller A, Sadove AM. Pediatric vascular lesions. *J Craniofac Surg* 2003;14:566-583
8. Weinstein JM, Chamlin SL. Quality of life in vascular anomalies. *Lymphat Res Biol* 2005;3:256-259
9. McHeik JN, Renauld V, Duport G, Vergnes P, Levard G. Surgical treatment of hemangioma in infants. *Br J Plast Surg* 2005;58:1067-1072
10. Boon LM, Enjolras O, Mulliken JB. Congenital hemangioma: evidence of accelerated involution. *J Pediatr* 1996;128:329-335
11. Kagawa K, Park S, Taniguchi K. Infantile fibrosarcoma. Report of two cases. *Scand J Plast Reconstr Surg Hand Surg* 1999;33:105-109
12. Boon LM, Fishman SJ, Lund DP, Mulliken JB. Congenital fibrosarcoma masquerading as congenital hemangioma: report of two cases. *J Pediatr Surg* 1995;30:1378-1381