The Role of Surgery in the Management of Infantile Hemangiomas: What is the Best Timing?

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KEYWORDS

• Surgery • Infantile hemangioma • Self-image • Timing • Developmental milestones

KEY POINTS

- Surgery can effect total removal of infantile hemangiomas.
- The aim of surgery, as with any other modality of treatment, is to obtain the best possible result for a given patient.
- Tumor size, location, and phase of the natural history in which the tumor presents for treatment have an impact on treatment options.

Surgery can effect total removal of infantile hemangiomas (IHs), set the stage for further multimodality treatment, or treat sequelae and complications of a tumor's natural history. Surgical techniques for removing IHs of specific anatomic locations can be found[1–3]; however, little has been written about the timing of surgery in the overall management of these tumors. The aim of surgery, as with any other modality of treatment, is to obtain the best possible result for a given patient. To successfully achieve that aim, defining what is meant by *best possible result* and by when to achieve that result is needed. Perhaps more important than defining the best possible result is to make a determination of what is an *acceptable result*. The visual impact of a 1-cm IH of the nasal tip is different from that of the same exact lesion on the thigh. The functional import of a 5-mm IH involving the oral commissure is potentially very different from the same lesion involving the upper eyelid. These examples highlight that variables, such as size and location, are important. What is considered acceptable as a result of treatment of the nasal tip and eyelid IH likely is different from that for the corresponding thigh and oral commissure lesions. To recap, IHs are true neoplasms that typically appear within the first few weeks of life and undergo rapid proliferation in the first 2 months. The rate of endothelial tumor cell hyperplasia slows down by approximately the sixth month and is overcome by apoptosis and regression of the tumor volume, mostly over the next 2 years to 3 years and even more slowly after that. This

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involution is characterized by slow replacement of the tumor burden by fibrofatty scar. Thus, during proliferation, the tissue that the clinician observes is quite different from that in involution and likewise variably responsive to different therapeutic modalities.

Thin, superficial, proliferating tumors may be amenable to laser or topical medical therapy. Thicker, larger, or functionally threatening proliferating lesions may require systemic medical therapy. During involution, when surgery is most useful, the type of IH (as defined by the depth of cutaneous involvement) determines the type of persistent tissue — thin superficial IHs may involute with no residuum whereas a compound IH may leave expanded, dystrophic, telangiectatic skin and a deep IH a mass underlying perfectly normal skin. Each scenario requires different potential medical, laser, and surgical options and combinations, which are discussed throughout this issue. Thus, tumor size, location, and phase of the natural history in which the tumor presents for treatment have an impact on treatment options. The choice of treatment options, however, cannot be based exclusively on the tumor qualities. Patients carrying the tumor need to be taken into account. This may seem an explicit concept when dealing with patients who can speak for themselves and make decisions and value judgements on their own behalf. Because the patients affected by IH are infants and young children, however, the burden of this decision making falls on parents and clinicians. Beyond relying on the characteristics of the tumor, as previously discussed, the best course of action can be further determined by considering the data on development of consciousness of self and on the value of restoration of appearance.

Self-awareness is a fundamental issue in developmental psychology that, in my opinion, is germane to the issue of when to strive to obtain the best possible result. Humans are a uniquely self-conscious species — caring how they look with others in mind. It is through the gaze of others that humans measure how securely accepted by others they are. Furmark[4] has shown that there is no more dreadful phobia than that of being socially rejected and alienated from others, which explains why people rank public speech as the most common, greatest fear. A review of the entire sequence of development of self-awareness,[5] although fascinating, is beyond the scope of this article. There is a general consensus, however, on a few major landmarks that are pertinent.[6] Infants between 3 months and 12 months old tend to treat their own image in a mirror as a playmate, an other. They are oblivious that a sticker or rouge has surreptitiously been placed on their forehead and is visible on the image in the mirror. By the end of the first year, children demonstrate enhanced curiosity of the specular image by touching or looking behind the mirror but still do not recognize their selves. It is only by 18 months that infants begin to look for the sticker or red blemish on their own bodies to remove it. This is the literal beginning of identity. At approximately 2 years of age, children begin to express embarrassment — the first signs of awareness of their public appearance. A stranger pointing at the hemangioma on a 2-year old's to 3-year old's face is recognized by the child as being about "me," that there is something that others see in them. Over time, this sense of self becomes rooted and by 3 years children begin to grasp the temporal dimension of the self — that their selves endure beyond what can be seen in the mirror or a photo. The cognitive ability of running a simulation of others' minds (what others are thinking of "me") is clearly established by age 3 years to 4 years. The basic fear and embarrassment that the red mark on the cheek that they see on themselves in the mirror persists and is visible to others at all times becomes ingrained by 4 years to 5 years of age.

A psychological profile survey of children with hemangiomas and their families[7] showed that given earlier intervention, affected children did not seem to experience significant emotional trauma from their condition; their families, however, experienced appreciable emotional and psychological distress in dealing with a child with a facial