

What is a hemangioma?

A hemangioma is a benign tumor of blood vessels resulting from abnormal blood vessel growth or abnormal lymph vessel growth. These vessels grow at a very rapid rate and can enlarge quickly during infancy. Hemangiomas tend to go away on their own (involute) as time goes on.

The incidence of hemangiomas in the infant population is 1 in every 2000 newborns. Girls are three times more likely to develop hemangiomas than boys. 60% of hemangiomas occur on the head or neck area. 10% of affected babies have more than one hemangioma.

Many babies are born with vascular birthmarks. These are blemishes on the skin that can result from either abnormal blood vessel growth or abnormal lymph vessel growth. There are mainly two classes of congenital blood vessel lesions. The first are hemangiomas and the second are vascular malformations. They are vastly different, and it is important to understand their difference because their treatments and how they effect your child are distinct. Hemangiomas are benign tumors that are made up of blood vessels that grow at a very rapid rate. These lesions tend to go away on their own, although they can enlarge very rapidly during infancy. Vascular malformations, on the other hand, are abnormally formed blood or lymph vessels that do not go away. They do not grow as a rapid pace, they are usually present at birth, and continue to grow along with your child throughout life. A hemangioma is a benign growth of blood vessels in the form of a tumor that are caused by an overgrowth of the cells that line these blood vessels. Hemangiomas typically grow very fast and often have unpredictable courses with the exception that in the end, they all to involute. The typical history for a patient with a hemangioma is that mom or dad noticed a small, red blemish somewhere on the body, which they thought was either a small birthmark or a scratch. This spot began to grow rapidly during what is called the proliferating phase. This proliferating phase can last up to a year. During this time, the growth of the lesion is typically very frightening to parents, and it is important to know that this hemangioma is not a cancer, but is actually a benign tumor, which will go away. At the end of the year, the rapid growth phase will be over. The growth will then plateau for a while and then the involution or shrinking phase will begin. This can last up to 7 years. The last phase is the involuted

or shrunken phase. Here, hemangiomas have reached their final stage and, in many cases, will have completely resolved, leaving only a small patch of irregular skin in their wake. In some patients there may be some abnormal vascular markings still present or some fullness of the tissue. We also know that hemangiomas occur in 1 in every 2000 newborns, which is about 10% Caucasian infants. Most hemangiomas are discovered in the first month of life. Girls are 3 times more likely to develop hemangiomas than boys. The sex of the child does not effect the rate and shrinkage of the hemangioma; 60% of all hemangiomas occur in the head and neck, and 10% of the effected babies have more than one hemangioma. When more than one hemangioma occurs in the same child they usually do not shrink at the same time or speed. The thickness of the hemangioma does not usually effect its final appearance, and the occurrence of ulcers can effect the final appearance after shrinkage, as some healed ulcers will leave noticeable scars that require surgical treatment. Most hemangiomas do not grow after the first year of life and once they shrink, they never come back. Approximately 75% of hemangiomas will go away completely. Those that do not may retain some of their red color and extra loose skin. Some may have abnormal streaking blood vessels called telangiectasias in them, which need to be treated by injection or laser. Dr. Stelnicki and the vascular anomalies team can help you with all parts of treatment of these hemangiomas. A simple call to our office will get you on your way to proper treatment. The color of the skin over the hemangioma depends on how far the hemangioma is away from the surface of the skin. Those that are right at the surface will be very red. However, those that are deeper will have a more purplish or bluish color. During the rapid growth phase, the hemangiomas can distort parts of the body's anatomy. They can ulcerate and occasionally bleed; however, this is usually controlled by local therapy alone. Occasionally, surgery is needed during the rapid growth phase if bleeding becomes a problem or if a significant vital structure is compromised by the growth of the lesion. If the hemangiomas are blocking the vision or airway, then surgical treatment is performed. In some patients, tracheostomy is required if airway compromise is severe in order to prevent life threatening complications of loss of airway and inability of the child to breathe. This is a rare complication of hemangioma, but it must be watched very closely in those that involve the mouth or around the trachea. Hemangiomas can occur in vital organs of the body, such as the

liver, spleen, and other tissues and, these need to be followed closely by MRI. Our interventional radiologist will embolize hemangiomas that are life threatening or compromise a particular organ system. The hematology oncology group working with Dr. Stelnicki will also recommend various medications, which can be used to either lessen the growth of the hemangioma or stop its growth completely. These medications can vary from anything from intralesional steroid use or extend up to more toxic drugs, such as interferon, vincristine, thalidomide, etc. The use of these drugs is carefully coordinated between Dr. Stelnicki and the hematology oncologist on the vascular anomalies team. Dr. Stelnicki will use a specific vascular laser to treat bleeding in ulcerated areas of the lesion. Laser therapy cannot completely eliminate hemangiomas and it is purely and adjunct therapy to other treatment modalities. Most hemangiomas will go away without treatment. When hemangiomas begin to regress, there is often a change in color from a red color to a more grayish color. Some blue patches will start to mend together and the hemangioma will soften and begin to shrink. Injection with steroids typically speeds this process along. As the hemangioma begins to decrease in size, there may be some loose skin that can remain. This extra skin may have a texture of Crepe paper and require surgical treatment. By age 4 or 5, the hemangiomas will have completely involuted and surgical therapy, if needed, can be performed safely. Dr. Stelnicki is a pediatric plastic surgeon that is skilled in the treatment of these hemangiomatous lesions and will work with you to optimize the cosmetic outcome for your child. As most hemangiomas will go away, observation is desirable until the child is near school age, at which stage any residual deformity from the hemangioma will be removed so as the child can avoid psychosocial problems of having a hemangioma. It is important to understand that prior to school age, most children are not psychologically effected by the presence of a vascular birthmark, and as long as their parents love them, care for them, and nurture them, there is nothing that they need to be concerned about in terms of their long-term psychological development. We feel strongly about the need to treat these patient's prior to the kids going to school so that the teasing and ridicule can be diminished or halted altogether.

What does a hemangioma look like?

The color of the skin over the hemangioma is associated with how near to

the surface of the skin it is. Right at the surface, they are bright red. Deeper hemangiomas will have a blue or purplish color.

What is the typical course of a hemangioma?

At first, most families notice a small, red growth somewhere on the body and attribute it to being a scratch or a birthmark. During the proliferative phase, the hemangioma grows rapidly. This phase of rapid growth typically last for a year.

This phase can be frightening to families, so it is important to remember that it is benign. Next, the hemangioma will plateau in growth and begin to involute, or shrink. This shrinking phase may last as long as 7 years. Lastly, the hemangioma reaches the involution phase, at which many completely resolve with very little evidence of existing (approximately 75%). Some leave a small patch of "crepe paper skin" and some leave abnormal vessels or fullness in the affected tissue.

What risk factors are associated with hemangiomas?

Due to the vascular nature of hemangiomas, they are constantly at risk of bleeding after any trauma to the area. The bleeding often requires a visit to the doctor's office in order to control it. An ulcer or infection may occur which will require wound care to resolve. Ulcers tend to cause scarring which does not go away and may need surgical intervention.

Hemangiomas cause problems when located near the eyes, ears, nose, or mouth. These areas are vital to the senses and must not be at risk of being occluded by the growth. They may also present problems when located on a joint (may cause limitation in range of motion of the affected joint) or on areas of pressure points.

Hemangiomas also may be derived from blood vessels shared with other organs. Dr. Stelnicki may potentially order an MRI scan in order to assess the possible involvement.

How are hemangiomas treated?

In the past, hemangiomas were often left alone to go through their phases and achieve involution without any medical intervention. The most current

way to treat these growths is with a variety of tactics.

Vascular Laser and Steroid Injections

A specific laser to treat vascular problems is now offered to stunt the growth of and shrink the hemangioma. Often in conjunction with this laser treatment is an injection of a steroid medicine to penetrate the deeper blood vessels of the lesion. The laser cannot completely eliminate the hemangioma and may require multiple treatments to reach the maximum outcome.

Propranolol & Oral Steroid Therapy

Dr. Stelnicki or your child's pediatrician may also refer your child to see a pediatric cardiologist to initiate systemic therapy with a medication called propranolol to help control the increasing size of the hemangioma. In special cases such as peri-ocular and laryngeal hemangiomas, oral steroids may be administered to help shrink the growth.

Surgery

Lastly, surgical excision of the hemangioma or abnormal scarring or skin left by the hemangioma may be recommended once the condition of the hemangioma allows for it to be safely removed. Observation is desirable until the child is near school age, at which stage any residual deformity from the hemangioma will be removed so as the child can avoid psychosocial problems of having a hemangioma. It is important to understand that prior to school age, most children are not psychologically affected by the presence of a vascular birthmark, and as long as their parents love them, care for them, and nurture them, there is nothing that they need to be concerned about in terms of their long-term psychological development. We feel strongly about the need to treat these patient's prior to the kids going to school so that the teasing and ridicule can be diminished or halted altogether.

Surgery is also reserved in special hemangioma cases such as peri-ocular hemangiomas that may lead to eye problems resulting in blindness.

Bleeding, Infection & Ulceration

In the event of a bleeding hemangioma, localized pressure is usually all

that's needed to control the bleeding. The ulcerated hemangioma may require in-office wound care comprised of prescription antibiotic and dressing changes. If bleeding persists uncontrollably, the vascular laser may be used in addition to cauterize these blood vessels. In the case of an infected lesion, a plan of care involving antibiotic treatment and wound care may be initiated.

Our hemangioma team

Dr. Stelnicki is the director of the Hemangioma and Vascular Anomalies team at Joe DiMaggio Children's Hospital. This team consists of a multitude of different doctors who are dedicated toward a multidisciplinary approach to the treatment of these anomalies. It consists of a craniofacial plastic surgeon, i.e. Dr. Stelnicki or Dr. Brooks, a pediatric ophthalmologist, a pediatric otolaryngologist, a pediatric hematology oncologist, a pediatric radiologist, pediatric interventional radiologist, a medical social worker, pediatric psychologist, speech pathologist, pediatric dentist, pediatric surgeon, and craniofacial team coordinator. Other therapists and physicians are also available for consultation on an as-needed basis.

This team is dedicated to the treatment of both hemangiomas and vascular anomalies. It meets every 2 months to discuss treatment of these anomalies and to develop a multidisciplinary treatment strategy, which optimizes the cosmetic and represents the most efficacious and rapid treatments for these problems. Many of these problems are chronic in nature and take years to treat properly. Carefully coordinated treatment is necessary so that services are not duplicated or that treatments that may seem good to one particular branch of medicine cannot impact negatively on the long-term outcome by compromising someone else's result. The team avoids a duplication or redundancy in services and maximizes the outcome for these kind of vascular birth anomalies.

Our hemangioma/AVM team consists of:

- 1 Craniofacial surgeon (Dr. Stelnicki)
- 2 Pediatrician (Hematologist/Oncologist)
- 3 Dermatology
- 4 Interventional radiology
- 5 Clinical psychologist

6 Ophthalmologist

Special Hemangiomas.

- 1 Rapidly growing, bleeding, painful hemangioma. In the case of very large lesions, steroids are helpful in controlling the increase in size. Depending on the patient's age and the location of the lesion, steroids can be given either intralesional or orally. This pulse dose of steroids will frequently speed involution and decrease growth. Other centers will use drugs such as alpha interferon, but in our experience these drugs have a high complication rate without offering a significant benefit over steroid therapy or first time therapy.
- 2 The ulcerating, constantly bleeding lesion is first treated topically with antibiotic creams and non-stick coverings which prevent drying. If the bleeding persists, then a tunable dye laser, specially designed to treat vascular lesions, is used to coagulate the surface. Eventually, with laser and steroid therapy, these hemangiomas can be controlled.
- 3 Peri-ocular hemangiomas. Hemangiomas around the eye pose a particular threat. If during their growth phase they obstruct the eye, they can cause irregular eye movements (strabismus) or cortical blindness (amblyopia). Therefore these lesions need to be treated emergently by a combination of steroid therapy and direct excision. If the hemangioma is small, it will be completely excised. If the lesion is large, then a partial excision to remove the area of ocular obstruction is required. This excision frequently brings on an early involution, which further aides in the therapy.
- 4 Laryngeal hemangiomas. These lesions run the risk of obstructing the airway if untreated. Our otolaryngology staff will aggressively treat these lesions early, through the use of endoscopic laser in order to prevent airway compromise. Pediatricians will also institute oral steroids to help shrink the lesion. In most cases, this routine, plus a tracheostomy, is successful in protecting the child from a catastrophic event.