Head and Neck Masses

Head and neck masses are commonly seen in children. Lymphadenopathy secondary to infections of the ear, nose, and throat are the most common. The second most common cause of head and neck masses are congenital. This presentation will focus on discussing common neck masses located in the lateral neck. These include branchial anomalies, vascular malformations, vascular tumors, lymphatic malformations, laryngoceles, teratomas, dermoid cysts and sternocleidomastoid tumors of infancy.

Branchial Arches

Between the 2nd and 6th week of gestation, the branchial arch apparatus undergoes development. At that time, the neck is shaped like a hollow tube with circumferential ridges (arches). Between the arches are other ridges termed clefts and pouches. The clefts are on the outside (ectoderm) and the pouches are on the inside (endoderm). Each arch leads to the development of a specific cartilage, artery, muscle component, and cranial nerve, all of which are neural crest in origin. Although there are six arches, only five form structures (I–IV and VI); the 5th arch fails to develop in humans.

The first arch is referred to as the “mandibular arch” as it lays the framework for the development of the mandible through Meckel’s cartilage. It also gives rise to the malleus head and neck as well as the incus body and short process. The muscles that are associated with the 1st arch are the muscles of mastication, anterior belly of the digastric, mylohyoid, tensor tympani, and tensor veli palatini. The cranial nerve is the trigeminal nerve (CN V), and the arteries are the maxillary and internal carotid arteries.

The second arch is the “hyoid arch.” Its cartilage is Reichert’s cartilage which gives rise to the stapes, malleus manubrium, incus long process, styloid process, and part of the hyoid bone (lesser horn and upper body). The muscles that this arch gives rise to are the muscles of facial expression, buccinator, platysma, stapedius, stylohyoid, and posterior belly of the digastic. The cranial nerve is the facial nerve (CN VII), and the artery is the stapedial artery.

The third arch gives rise to the remainder of the hyoid bone (greater horn and lower body), stylopharyngeus, glossoptiharyngeal nerve (CN IX), and the common carotid artery. The fourth arch gives rise to the thyroid, epiglottic, and cuneiform cartilages as well as the cricothyroid and inferior
constrictor muscles. In addition, the fourth arch leads to the development of the superior laryngeal nerve and the subclavian artery and aortic arch. The sixth arch gives rise to the cricoid, arytenoid, and corniculate cartilages. The muscles are all the intrinsic muscles of the larynx except the cricothyroid. The nerve associated with the sixth arch is the recurrent laryngeal nerve while the artery is the pulmonary artery.

When errors occur in branchial cleft development, the most notable outcome is a branchial cleft cyst. However, other anomalies may result as well. When a pouch or cleft fails to obliterate, it may communicate with either skin or mucosa of the upper airway forming a sinus. When both a pouch and a cleft fails to obliterate, it may form a communication between the skin and the mucosa, this is called a fistula. When a branchial cleft remnant forms an epithelial-lined space without communication to the skin or mucosa and a cyst is formed.

As stated previously, the most notable anomaly involved with improper development of the brachial cleft is the branchial cleft cyst. There are four recognized types, and most are unilateral in presentation. However, 2-3% of cases may present with bilateral cysts. It is important to keep in mind that a branchial anomaly and its associated tract typically lies inferior to all the derivatives of its associated arch and superior to all derivatives of the next arch.

The first branchial cleft cyst can be broken down into two types by the Work classification. It comprises 5-255 of all branchial anomalies. A type I cyst is of ectoderm origin and usually involves the preauricular area. The sinus tract associated with this type of cyst starts in the preauricular area, parallels the external auditory canal while typically staying lateral to the facial nerve, and ends either in the external auditory canal or the middle ear. A type II cyst is more common than the type I cyst, and is made up of ectoderm and mesoderm. This cyst will typically appear around the angle of the mandible or in the submandibular region. The tract its sinus takes is from the angle of the mandible or submandibular region into the substance of the parotid gland going medial or lateral to the facial nerve, and ending in the conchal bowl or at the bony-cartilaginous junction of the external auditory canal. It is important to keep in mind that a first branchial anomaly may present in a child with recurrent otitis media in absence of middle ear disease.

A second branchial cleft cyst is the most common type of branchial cleft cyst, representing roughly 90% of all cases. This cyst typically appears as a mass just anterior and medial to the Sternocleidomastoid muscle in the neck. The tract that the sinus takes goes from this region of the neck, along the carotid sheath and between the external and internal carotid arteries. It then passes superficial to the 9th and 12th cranial nerves before piercing the tonsillar fossa. Unilateral fistulae are most common on the right (89%). Bilateral anomalies are associated Branchio-oto-renal syndrome. This syndrome is associated with branchial cleft cysts, sinuses, fistulas, malformed pinna, pre-auricular pits, hearing loss and hypoplastic kidneys.

The third branchial cleft cyst is rarer than a first or second branchial cleft cyst and typically only occurs on the left side of the neck. These cysts appear in a similar location as the second branchial cleft cyst, but their sinus tract differs. Instead of passing through the internal and external carotid arteries, the sinus tract will go behind the two. It will also run deep to the 9th nerve while staying superficial to the hypoglossal, superior and recurrent laryngeal nerves. It will then open into the apex of the pyriform sinus.
The fourth branchial cleft cyst is the rarest of all, with roughly 200 cases reported in the literature. This cyst is usually lower in the neck than the second and third cyst, with its tract taking a much different course than the other cysts. The sinus tract will go deep to the common carotid before looping around the aorta on the left or subclavian on the right. At this point, the tract will go deep to the superior laryngeal nerve while staying superficial to the recurrent laryngeal nerve. At this point, it pierces the thyrohyoid membrane and enters the pyriform sinus at its apex. Of note, both third and fourth branchial cleft cysts may be closely associated with the thyroid gland. For this reason, if a patient is suffering from recurrent thyroid infections/abscesses, a third or fourth branchial cleft anomaly must be considered.

When working up a branchial cleft cyst, one must of course start with a detailed history and physical examination. Following this, imaging studies are usually obtained. There are multiple modalities, but typically a CT scan is ordered. On CT, a branchial cleft cyst appears as a homogeneous mass with a central area of low attenuation and a smooth enhancing rim. Although CT does provide for a good radiographic evaluation of the cyst, it does have some drawbacks. It is more expensive than an ultrasound, and results in more radiation exposure. In addition, children may require sedation in order to obtain the exam. On ultrasonography, branchial cleft cysts will appear as a lesion with an area of low echogenicity and lack of internal septations. This is the easiest and most cost effective imagining modality. However, it is not as helpful with surgical planning and thus is typically not ordered alone. MRI is another option available for imaging, although is not commonly obtained due to its high cost and need for sedation in children. On MRI, a branchial cleft cyst will appear hypointense on T1 and hyperintense on T2. Other imagining modalities include fluoroscopic fistulography and barium esophagoscope. Both of these can help with delineating the path of the sinus tract, which will aid in surgical planning. Fluoroscopic fistulography or CT fistulography help locate first branchial anomalies. Barium swallow esophagoscope help locate sinus/fistulas in thirda and fourth branchial anomalies.

Treatment

Treatment of the branchial cleft cyst is dependent on whether an infection is present or not. If the cyst is infected, antibiotics should be given for 2-4 weeks in an attempt at clearing the infection prior to surgical resection of the cyst. If an abscess has formed, it will usually require drainage. If possible, the least invasive procedure should be attempted to drain these abscesses because the more dissection that is performed, the harder it will be to completely remove the cyst at a future operation secondary to scar formation. For this reason, needle aspiration should be considered first. If the abscess persists, then an incision and drainage should be performed.

The definitive treatment of a branchial cleft cyst is complete surgical excision of the tract and cyst. For first branchial cleft cysts, the facial nerve must be identified as the tracts are usually closely associated with the nerve. It has been recommended by some surgeons to wait until the patient is two years of age to allow for a more favorable anatomic location of the facial nerve. However, this is controversial as this could lead to more infections and more scaring, making it more difficult to remove the cyst and tract in the future.

When a third or fourth branchial cleft cyst is suspected, one should start by examining the pyriform sinus with a direct laryngoscopy, looking for a sinus opening. If there is one, a Fogarty vascular catheter could potentially be threaded through the sinus and into the tract, greatly aiding in the identification of the tract when the neck is entered. For both of these cysts, the surgeon should also identify the recurrent laryngeal nerve in order to avoid injuring it during dissection because both of these cysts’ tracts are usually closely associated with it.
Another treatment option available for fourth branchial cleft cysts comes in the form of endoscopic cauterization of the sinus opening through the pyriform sinus during a direct laryngoscopy. This has been described in multiple studies and case reports with good results.

**Vascular Anomalies**

Vascular anomalies are classified based on histology, biological behavior and clinical presentation. Vascular tumors grow by cellular hyperplasia. Vascular malformations is a term used to describe several different types of abnormal links between blood or lymphatic vessels. Vascular malformations are divided into high flow, low flow and mixed.

**Hemangiomas**

Hemangiomas are the most common tumors of infancy, they are not present at birth but up to 30% may have a sentinel macule or telangiectasia. They proliferate in the first 9 months of life and begin to involute at 18-24 months of life. They are most commonly found in Caucasians with a male to female ratio of 1:6. Sixty percent of hemangiomas present in the head and neck, 25% occur in the trunk and 15% on the extremities. Eighty percent of all hemangiomas are single lesions but 20% of affected infants develop multiple lesions. They are also common in premature infants, infants born to mothers of advanced maternal age, with a history of chorionic villus sampling, preeclampsia or placenta previa. Histologically proliferating hemangiomas consist of endothelial hyperplasia. There are two theories that explain the pathogenesis of hemangioma. First theory, suggests that hemangioma endothelial cells arise from disrupted placental tissue imbedded in fetal soft tissues during gestation or birth. Markers in hemangiomas of infancy coincide with endothelial markers found in placental tissue, GLUT-1. The presence of GLUT-1 can also distinguish hemangiomas from other vascular tumors including congenital hemangiomas. Congenital hemangiomas are rare, are found at birth and are less well understood. The second theory involves the endothelial progenitor and stem cells. Superficial hemangiomas (capillary) of infancy present as cherry red macules and papules; deep hemangiomas (cavernous) are firm rubbery subcutaneous masses with bluish discoloration, compound hemangiomas (capillary cavernous) are a combination of the two.

Hemangiomas are further subclassified as focal versus segmental. Focal hemangiomas are localized, unilocular lesions which adhere to the phases of growth and involution. Segmental hemangiomas are more diffuse plaque like lesions that can lead to poor functional and aesthetic outcomes. PHACES syndrome (Posterior fossa brain malformations, hemangiomas of the face, arterial cerebrovascular anomalies, cardiovascular anomalies, eye anomalies, sternal defects, or supraumbilical raphe) should be ruled out in patients with segmental hemangiomas. Patients that develop a hemangioma in a beard like distribution are associated with a subglottic hemangioma 60% of the time. Hemangiomas are easily diagnosed clinically with a history of rapid proliferation. When the diagnosis of a hemangioma is unclear a Doppler ultrasound or MRI can be used. An MRI is recommended to exclude visceral and cerebral angiomas in patients with more than three cutaneous hemangiomas. Management of hemangiomas is mainly close observation, however 40% of patients require further intervention because of bleeding, ulceration, visual axis obstruction, high-output heart failure, airway obstruction or risk of permanent disfigurement. Medical management includes, propranolol, corticosteroids, interferon, and vincristine. Many clinicians now recommend propranolol as the first line treatment option for hemangiomas, over 90% of patients have dramatic reduction in the size of their hemangiomas as early as 1-2 weeks following the first dose of propranolol. Recommended dosage is 2mg/kg/day.
Side effects are hypoglycemia, lethargy, heart block. Patients should get cardiology clearance prior to starting therapy. Propranolol should be given with meals to prevent hypoglycemia. It should be avoided in patients with heart defects, cardiac arrhythmias, asthma, and reactive airway disease. Systemic corticosteroids (prednisone, prednisolone) at a dose of 2-5 mg/kg/day for 4-12 weeks followed by gradual dosing taper. Complications include systemic effects such as irritability, insomnia, gastric irritation, hyperglycemia, growth suppression and adrenal suppression. Intrallesional steroids allow for higher intrallesional concentrations (triamcinolone 3-4mg/kg with a maximum of 20 mg per session).

Complications include dermal atrophy and systemic effects. Vincristine (1-1.5 mg/m2) and interferon alpha (30,000,000IU/m2/day are reserved for severe hemangiomas (heart failure, bleeding ulcerated lesions) unresponsive to corticosteroids. Side effects include neurologic sequela/spastic diplegia. Surgical excision is reserved for patients with poor involution or significant skin changes, an elliptical incision is oriented along skin tension lines. Pulse dye laser is used for residual erythema and telangiectasias that remain after involuted hemangiomas. Ulcerative lesions during proliferation can also be treated with pulse dye laser to induce healing and new epidermal growth.

**Lymphatic anomalies**

The lymphatic vessels develop as spaces in embryonic tissue or as buddings from the primary lymph sacs. These coalesce to form definitive channels that drain into the venous system. Lymphatic malformations result from the failure of lymph spaces to connect to the rest of the lymphatic system. Lymphatic malformations can present at birth with the majority of them presenting by age 2 and are common in both males and females equally. Up to 60% are detected in utero by ultrasonography. Postnatal presence of lymphatic malformations are not associated with congenital abnormalities. These lesions present as painless, soft “doughy”, compressible masses, and can be transilluminated. They enlarge with URI and regress with resolution of the infections. Lymphatic malformations have been classified based on their histological appearance: capillary lymphangiomas (capillary like lymphatic vasculature), cavernous lymphangiomas (dilated lymphatic channels with one or several endothelial layers), and cystic hygromas (large multilocular cysts).

They can also be classified as microcystic (<2cm in diameter), macrocystic (>2 cm in diameter) or mixed. Microcystic malformations tend to be invasive with ill-defined margins and may extend from the skin to mucosal surfaces. Microcystic lesions also tend to be found above the mylohyoid. Macro cystic lesions are more well defined, circumscribed and encapsulated. Macro cystic lesions tend to be found below the level of the mylohyoid. Mulliken and Glowacki have divided lymphatic malformations into two types: Type I, the malformation is below the level of the mylohyoid and the malformation is usually macrocystic; Type II, the malformation is above the level of the mylohyoid and tend to be microcystic with poorly defined margins, and are invasive. Lymphatic malformations may extend through the full thickness of the skin to mucosal surfaces of mouth, base of tongue, larynx and pharynx thus, all patients should have a thorough examination with direct laryngoscopy and bronchoscopy. These lesions may also enlarge and infiltrate vital structures that may lead to dysphagia and airway compromise. In these situations aspiration of the lesion can serve as a temporizing measure.

**Surgical Excision vs. Sclerotherapy**

Surgical excision is the mainstay of treatment. Type I lesions can be excised with only a small chance of recurrence, whereas Type II lesions because of their location and proximity to cranial nerves (facial, hypoglossal, lingual N.) and blood vessels (lingual artery) it may be necessary to leave residual
lymphatics versus damaging these structures. Radiologic studies such as US, CT and/or MRI help with diagnosis and will show a multiloculated cyst. CT with contrast allows to see its venous component. MRI is superior because it allows for better visualization of nerves and extent of the lesion. Pre-natal ultrasound can detect the malformation and assess if the patients airway may be compromised. Macrocystic lesions respond well to sclerotherapy whereas microcystic lesions do not. The following agents are being used although none have been FDA approved: bleomycin, ethanol, tetracycline, OK-432. OK 432 is a lyophilized mixture of group A Strep pyogenes, the cystic fluid is aspirated and OK-432 is injected. Regression of lymphangiomas have been reported in up to 96% of patients with macrocystic lymphangiomas. Therapeutic response takes about 6 weeks. The injection is associated with swelling, erythema, pain and low-grade fever for up to 5 days. Major complications reported by Giguere et al include airway compromise secondary to the inflammatory reaction and cellulitis. Okazaki et al. recommended OK 432 injection therapy alone for single macrocystic lesions and surgical excision after pretreatment with OK-432 for microcystic lesions. OK-432 is chosen over other sclerosing agents because it has the advantage of not causing perilesional fibrosis thus making post-sclerosing surgical excision more manageable. Doxycycline is more effective in treating microcystic lymphangiomas than OK-432. Shiels et al reported complete cyst ablation in all patients with microcystic lymphangiomas treated with doxycycline. The exact mechanism is unknown. However, an inflammatory reaction associated with erythema and fever that is typical after OK-432 injection does not occur. Unlike OK-432, doxycycline is associated with severe pain and discomfort on injection thus most patients require general anesthetia. Doxycycline is relatively safe, a typical side effect is dental staining in children. Ethanol good response when used for macrocystic lymphangiomas but require drainage catheters to continuous suction for 3 days. It is also associated with increased risk of complications because alcohol can easily pass into normal adjacent tissues and structures and lead to nerve injury, skin necrosis and systemic effects (hypotension, arrhythmias, seizures, death). Thus it is impractical to use in small children with large lesions because the volume of ethanol should be 0.5 ml/kg to minimize complications. Bleomycin is a cytotoxic antitumor agent, side effects of flu-like symptoms, edema, pigmentation of the skin, hair loss and systemic complications of pulmonary fibrosis, side effects are dose dependent. Sclerotherapy seems to be especially recommended for macrocystic lymphangiomas and macrocystic components of mixed lesions with the current trend toward the use of OK-432. However, recent reports have demonstrated that microcystic lymphangiomas may respond very well to doxycycline.

**Venous Malformations**

Venous malformations are also slow-flow vascular anomalies composed of ectatic venous channels. Lesions are present at birth and proportionally grow with the child. The incidence of VM is 1 in 10,000. VM more commonly occur sporadically but familial patterns have been seen, the inherited forms of have been localized to chromosome 9. Venous malformations have been associated with loss-of-function mutation on the angiopoetin receptor gene TIE2/TEK (tyrosine kinase), upregulation of several growth factors (TGR-beta and beta-FGF), progesterone receptors have also been seen in VM. Rapid expansion occurs during adolescence/adulthood secondary to puberty, pregnancy or traumatic injury. VM are found in muscle are soft, compressible and have a bluish hue to them. They swell with valsalva maneuver or dependent positioning. VM can occur anywhere in the body but are most commonly found in the H&N where they involve the oral cavity, airway, cervical musculature. Complications associated with VM include pain, thrombosis, calcified thrombi, and intralesional coagulopathy. Elevated D-dimers and low fibrinogen associated with intralesional coagulopathy means a higher risk of severe intraoperative/perioperative bleeding. This condition can be treated with LMWH. MRI is the modality of choice for diagnosis. Surgical excision is the treatment of choice for some
lesions it is recommended to treat preoperatively with sclerotherapy to decrease intraoperative bleeding. Preferred sclerosing agents include ethanol and sotradecol.

**Capillary Malformations**

Capillary malformations are sporadic lesions consisting of dilated capillary-like channels. They occur in 0.3% of children. Most commonly found in the cervical facial region. These lesions are referred to stork bites in the neck, angel kisses on the forehead. Port-wine stains have a protracted course and present along the distribution of the trigeminal nerve and can be associated to sturge-weber syndrome and kippel trenauay syndrome. CMs present at birth as flat, red or purple cutaneous patches with irregular borders. These lesions are also painless. CMs are usually diagnosed clinically but when unsure of a diagnosis you can get an MRI. Treatment of choice is laser therapy with PDL. These lesions require multiple treatments because the laser slowly causes the redness of the lesion to fade. Surgical excision is an option in advanced lesions that have become nodular.

AVM’s are congenital high flow vascular malformations composed of fast-flow vascular malformations composed of anomalous capillary beds shunting blood from the arterial system to the venous system. They present at birth as slight blush and are often misdiagnosed. AVMs are often dormant for many years and grow in proportion with the child. Intermittent expansion/growth is seen. Hormonal changes (puberty) are seen to influence growth as well. AVMs are characterized by palpable warmth, pulse, thrill, due to its high vascular flow. The overlying skin may have well-demarcated blush. The course of AVMs are characterized by 4 stages: Dormancy, expansion, infiltration/destruction, and heart failure. Imaging modalities of choice are MRA and CTA. Although CTA allows good visualization of surrounding tissues and bones, the central nidus and can allow for intravascular embolization. Treatment includes preoperative embolization followed by surgery.

**Thymic Cysts**

The thymus develops from the third pharyngeal pouch and it transverses the neck from the angle of the mandible to the midline and descends to the mediastinum during the sixth week of fetal life. Thymic cyst arise when there is implantation of thymic tissue along this descent. Thymic cysts are usually unilateral, painless neck masses in the lower neck and within the carotid sheath. They may become painful if infected. They are most commonly seen in males than females (3-4:1). Cases of ectopic cervical thymus have been reported and usually present with hyperplasia of the tissue after infection or vaccination. Thus it is important to evaluate for mediastinal thymic tissue prior to excision. Mass can be evaluated with CT, MRI or U/S these imaging modalities help differentiate thymic cysts which form a single cystic lesion from a cystic hygroma that have multiple large cysts within the mass. Treatment is surgical excision and diagnosis is confirmed histologically with the presence of Hassall corpuscles.

**Ranulas**

Ranulas are mucous retention cysts of the sublingual gland that present as a soft, bluish swelling in the anterior floor of the mouth. Extravasation of mucous from the ruptured sublingual gland duct and extends through the mylohyoid into the neck they are called plunging ranulas. A congenital predisposition has been associated with the development of plunging ranulas based on anatomic anomalies in the mylohyoid muscle and the occurrence of plunging ranulas among siblings. Extensions of the ranula into the neck can occur along the deep lobe of the submandibular gland between the
mylohyoid and hypoglossal muscles or from congenital dehiscence in the mylohyoid muscle itself, with part of the SLG projecting into it. This finding is seen in up to one third of normal individuals and corresponds to the Gaughran mylohyoid boutonniere. These lesions are slow growing, soft, painless masses in the superior cervical neck. CT or MRI can distinguish a ranula from a lymphatic malformation. Ranulas localized on the floor of the mouth are managed with intraoral marsupilization or complete excision. Plunging ranulas require complete excision via a transcervical approach along with excision of the sublingual gland.

**Laryngocele**

A laryngocele is defined as an abnormal dilation/herniation of the saccule of the larynx. Laryngoceles can be classified as internal, external or mixed. A laryngocele is classified as internal if the dilation lies within the limits of the thyroid cartilage, an external laryngocele extends cephalad to protrude laterally into the neck through the thyrohyoid membrane. Laryngoceles may be purely congenital as seen in a newborn; may represent a congenital defect as seen in infants and children which become apparent by increased laryngeal pressure (valsalva) or may be acquired in people whose occupations/hobbies involve prolonged periods of increased laryngeal pressure (glass blowers). Children may present with intermittent hoarseness, dyspnea, weak cry and in the case of external laryngoceles, a lateral neck mass. The mass is soft and compressible. Direct laryngoscopy may reveal a smooth dilation at the level of the false cord, CT scan should show an air filled cyst/dilation. Treatment includes laryngoscopic decompression for small lesions or laser endoscopy. Surgical excision via an external approach is reserved for larger lesions, this is done by incising the thyrohyoid membrane along the superior margin of the thyroid cartilage while protecting the superior laryngeal nerve and ligating the base of the cyst.

**Teratomas**

Teratomas are a group of tumors that contain all three germ layers (ectoderm, mesoderm and endoderm), they occur in 1:4000 births and 3.5% of all teratomas occurs in the head and neck. Teratomas are more common in females than males (6:1) in other parts of the body, but in the head and neck the female to male ratio is equal. The most common site is the nasopharynx followed by the lateral neck. Teratomas commonly develop during the second trimester and can rapidly expand causing esophageal and/or airway obstruction, this may result in the need of an EXIT procedure (ex utero intrapartum treatment) which allows for maintenance of uteroplacental circulation while establishing a safe airway. A history of maternal polyhydramnios is commonly seen. Most teratomas present as a firm lateral neck mass. Intrinsic calcifications may be seen on CT and/or MRI. Treatment is surgical excision, one must make sure to completely excise the mass or else teratomas will recur.

**Dermoid Cysts**

Dermoid cysts are composed of one or two germ layers (ectoderm and/or mesoderm). These cysts occur as a result of entrapment of epithelial components along embryonic fusion lines. Dermoids are most common in the midline usually in the submental area of the neck but can occur laterally as well. These are painless, superficial masses that move freely with the underlying skin. Ultrasonography and/or CT may assist in additional diagnostic evaluation. Like teratomas, treatment is surgical excision, one must make sure completely excise the mass and avoid intraoperative rupture as this can result in increased rate of recurrence. Dermoids are also common in the orbit, nose, nasopharynx, and oral
cavity. Those in the nose and orbit may have intracranial extension thus a CT and/or MRI should be performed prior to surgical excision.

**Psuedotumor**

Psuedotumor of infancy or SCM tumor of infancy presents as a firm, painless and mobile neck mass within the SCM. Usually this results secondary to injury to the SCM in utero (carrying multiples) or during delivery (breech presentation). It is commonly seen at birth or within the first 3 weeks of life. It is associated with congenital hip dysplasia and congenital torticollis. The patients head will be tilted toward the side of the shortened muscle and the chin rotates toward the opposite side. Ultrasound is diagnostic. It is important to rule out a fracture of the clavicle or c-spine injury/abnormality. Fifty to seventy percent of cases resolve spontaneously within 1 year. For patients with torticollis physical therapy prevents plagioccephaly and craniofacial asymmetry. Surgery is reserved for patients unresponsive to physical therapy, those with long standing history of torticollis or those diagnosed after the age of 1. Surgery involves making and incision over the mass and separating it from normal tissue while preserving SCM. Patients with long standing torticollis may benefit from release of the SCM.

**Harold Pine, MD discusses Dr. Sharon Ramos’ presentation**

Very good, Dr. Ramos. One of my biggest challenges is trying to figure out what is just a run of the mill infected abscess in the neck versus what is a branchial cleft anomaly that is infected, right? For an abscess we’re always taught “Just get in there and drain it, I&D it” for the branchial anomaly we’re sorta told “Well, you might mess it up by doing that or end up leaving a chronically draining sinus fistula.” So at this time I’m not sure we even know- the bottom line is that if it looks and smells like a frank abscess I think we’re obligated to get the pus out of there. If you just FNA an abscess it’s likely to come back so I don’t know what the “right” answer is.

I don’t know if you said sclerotherapy is the treatment of choice or the standard of care for these macrocystic lymphatic malformations and I’ve used this successfully. I’d like to send a “Thankyou” to the gang at Texas Childrens. They have a team up there that does a lot of this and I’ve had children successfully treated up there with sclerotherapy. However, there are teams out there and Ben Hartley who was one of my mentors at Great Ormond Street is probably one of the foremost world’s experts on just surgically excising these things. His comment on this is “Look, if you’ve got the guts to go in there and you’re willing to patiently dissect these things out your best option is to just get them out.” I did a couple real big ones with him and it was very satisfying and he convinced me that you just don’t have to get it all out and if you leave a little, lots of those will be clinically insignificant. Those people who have had to operate on children who have had sclerotherapy say that it’s a lot more difficult and things do get scarred up in there.
References

- Whetstone et al. Fluoroscopic and CT fistulography of the first branchial cleft. AJNR October 2006 27: 1817-1819