Case Report

Journey of a Child with Cystic Hygroma and its Successful Outcome Following Non-Surgical Management with injection Bleomycin in a Tertiary Eye Care Center of Bangladesh

Sidratul Muntaha Naznin[1], Mohammad Mostafa Hossain[2]

Abstract

Aim: Cystic hygroma is a congenital malformation of the lymphatic system. Surgical excision is the treatment of choice, but injection of sclerosing agent into the cyst is an alternative procedure. The aim of this study was to report a case with successful outcome with using sclerosing agent intralesional bleomycin injection despite of surgery. **Materials and methods:** Mr. X; a baby boy hailing from Cumilla with the complaints of right sided facial swelling since birth in the pediatric outpatient department of a tertiary eye hospital in 2018. On basis of clinical examination and radiological imaging he was diagnosed as right sided ptosis due to cystic hygroma involving right eyelid, orbit and hemi facial portion of face. Visual acuity was fixation and following at birth. After neuro surgical evaluation he was treated by applying intralesional Bleomycin injection (.3-.6 mg/Kg) at 6 sessions. Primary size of the lesion was 10.6X7.2cm. In each follow up his size of facial swelling was dramatically reduced with time. After completing six sessions in 2023 his lesion was significantly reduced to (2.5X1cm) and his vision is 6/60 in right eye and 6/6 in left eye. Now he was given to patching therapy to treat the stimulation deprived amblyopia. **Results:** Excellent result was observed after applying Inj Bleomycin of 6 sessions .The swelling was reduced in size and no significant complication was observed. **Conclusion:** Intralesional bleomycin injection is effective, safe and useful for the treatment of cystic hygroma with low complication rates.

Key words: Cystic hygroma, surgical excision, bleomycin, complications

(J.Natl.Inst.Ophthalmol.2023;6(2):67-72)

Introduction

Hygroma is a Greek word meaning water containing tumour. It is congenital malformations of lymphatic system. Cystic hygroma occurs more frequently as compared to other types of lymphangioma, and may compose of single or multiple macrocystic lesions having scarce communication with normal lymphatic channels. [1]

Lymphangiomas are usually classified as capillary, cavernous or cystic lymphangiomas. They may also be classified more conveniently, on the basis of size of the cysts contained, as microcystic, macrocystic and mixed lymphangiomas. Microcystic lymphangioma consists of cysts measuring less than 2 cm in size, whereas the size of cysts in case of macrocystic lymphangioma is more than 2 cm. The mixed lymphangioma is characterized by cysts of variable sizes, i.e. some cysts are more than 2 cm in size and others are less than 2 cm.[2,3]

Case report:

Mr. Fahad, a baby boy hailing from cumilla with the complaints of right sided facial swelling since birth in the pediatric outpatient department of a tertiary eye hospital in 2018. On basis of clinical examination and radiological imaging he was diagnosed as ptosis due to cystic hygroma involving right eyelid, orbit and hemi facial portion of face. Visual acuity was fixation and following at birth. After neuro surgical evaluation he was adviced to do duplex study of the swelling. It showed arteriovenous malformation (AVM) predominantly on right

1. Associate Professor cum consultant, Pediatric department, Ispahani Islamia Eye Institute& Hospital
2. Professor cum senior consultant, Pediatric department, Ispahani Islamia Eye Institute & hospital

Address of correspondence:
Sidratul Muntaha Naznin
Associate professor cum consultant, Pediatric department, Ispahani Islamia Eye Institute & Hospital
E-mail: nsidratulmuntaha@gmail.com
Contact no: 01316100916
Received: 15 Aug. 2022 **Accepted:** 17 Nov. 2022

side of face. He was treated by applying intralesional Bleomycin injection (.3-.6 mg/Kg) at 6 sessions at one month interval. Primary size of the lesion was 10.6X7.2cm. In each follow up his size of facial swelling was dramatically reduced and regressed orbital swelling fully with time. After completing six sessions in 2023 his lesion was significantly reduced to (2.5X1cm) and his vision is 2/60 in right eye and 6/6 in left eye. Now he was given to patching therapy to treat the stimulus derivation amblyopia.

Fig: Right sided Frontal cystic hygroma

Fig: 1 Condition at 6 month of age

Fig: 2 improved condition after 6 session of Bleomycin

Discussion

Embryology:

In the eighth week of gestation, six lymphatic sacs can be identified in the developing embryo. These lymphatic sacs are two jugular sacs, two iliac, one at the base of root of mesentery and one dorsal to the abdominal aorta (cysterna chyli). Jugular lymphatic sacs develop in the region of neck, whereas iliac sacs develop in the lumbar region. Later on, a network of lymphatics develops that communicate with lymphatics of various regions. During the ninth week of gestation, these sacs are invaded by connective tissue to form lymph nodes.[2]

Embryologically, these lesions are believed to originate from sequestration of lymphatic tissue from lymphatic sacs, during the development of lymphaticovenous sacs. These sequestered tissues fail to communicate with remainder of the lymphatic or venous system. Later on, dilatation of the sequestered lymphatic tissues ensues, resulting in the cystic morphology of these lesions.[2]

Location:

Cystic hygromas can manifest anywhere in the body. The common locations are cervicofacial regions (especially posterior cervical triangle), axilla, mediastinum, groin and below tongue. Occasionally, these malformations occur in liver, spleen, kidney and intestine. Omental cyst in omentum and mesenteric cyst in the mesentery of intestine represents parallel lesions at these locations.[4–6]

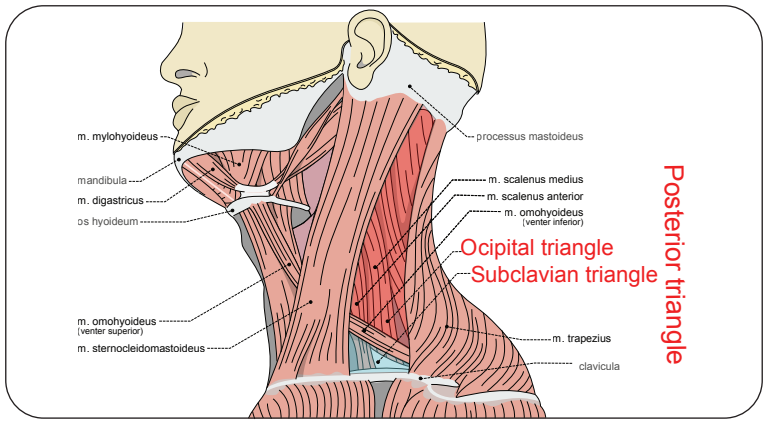

Fig: Common location of cystic hygroma

A cystic hygroma is an abnormal growth that usually appears on a baby's neck or head. It consists of one or more cysts and tends to grow larger over time. The disorder usually develops while the fetus is still in the uterus, but can also appear after birth.

Also known as cystic lymphangioma and macrocystic lymphatic malformation, the growth is often a congenital lymphatic lesion of many small cavities (multiloculated) that can arise anywhere, but is classically found in the left posterior triangle of the neck and armpits. The malformation contains large cyst-like cavities containing lymph, a watery fluid that circulates throughout the lymphatic system. Microscopically, cystic hygroma consists of multiple locules filled with lymph. Deep locules are quite big, but they decrease in size towards the surface.

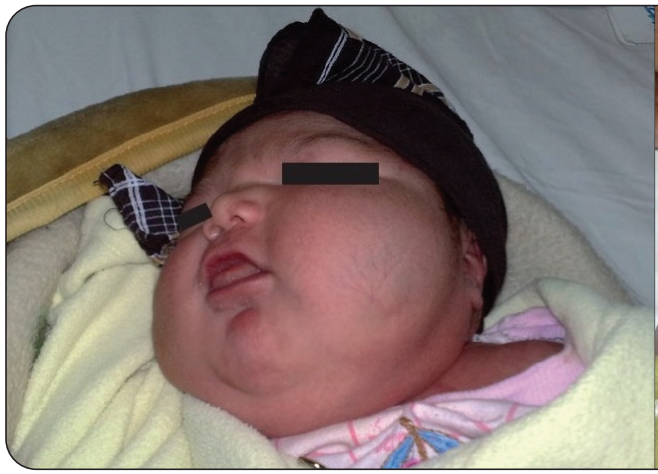

Fig: Cystic Hygroma on the cheek

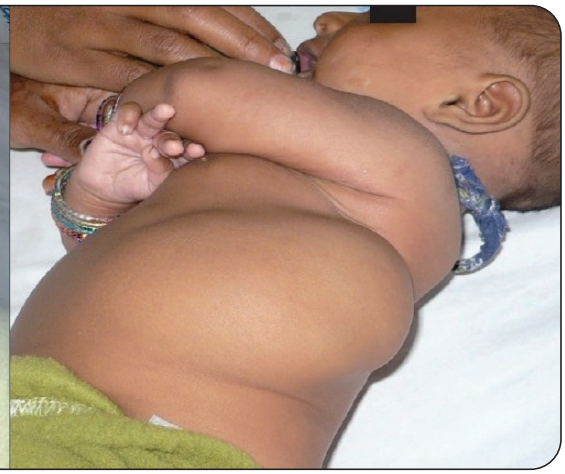

Fig: Cystic Hygroma on lumber region

Diagnosis of cystic hygromas:

The usual presentation of cystic hygroma apparent at birth is a painless mass. The other modes of presentations are related to the complications or effects of cystic hygroma, such as respiratory distress, feeding difficulty, fever, sudden increase in the size and infection in the lesion.[1–3]

On clinical examinations, these lesions appear soft, compressible, non-tender, transluminant and without any bruit [4]. Ultrasound of the lesion usually features multicystic lesion with internal septations and no blood flow is detected on color doppler ultrasonographs. Other modalities like CT scan and MRI can be employed to delineate the lesion, in a better way. A CT scan demonstrates multicystic, homogeneous, non-invasive density with low attenuation. These cysts may produce milky, serous, sero sanguinous or straw coloured fluid, when aspirated with a wide-bore needle.[5]

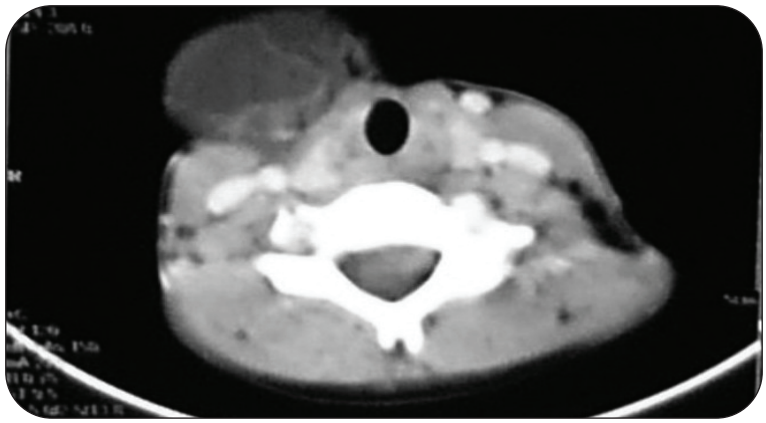

Fig: CT scan of Cystic Hygroma in the neck of a patient

The prenatal diagnosis of cystic hygroma using ultrasound is well documented in the literature. This malformation is commonly localized in the nuchal region. An additional 20% are found in the axilla, while the remaining 5% are found in the mediastinum, retroperitoneum, abdominal viscera, groin, bones and scrotum. The characteristic sonographic appearance on antenatal ultrasonography is multiseptate, thin-walled cystic mass; occasionally the cystic mass may have a more complex echo texture with cystic and solid components. The foetus with cystic hygroma can be associated with other anomalies in about 62% cases. The associated anomalies are Turner's syndrome, Down's syndrome, Trisomy 18, Trisomy 13, Noonan syndrome, etc.[13–16]

Sometimes biopsy correlation is needed for the precise diagnosis of the lesion occurring at unusual sites such as laryngeal, intra-oral and orbital lymphangiomas.[17,18]

Management of cystic hygroma:

Cystic hygromas are benign lesions and can remain asymptomatic in a patient for long duration. The indications of treatment are recurrent bouts of infection in the lesion, respiratory distress, dysphagia, haemorrhage inside cystic hygroma, sudden increase in the size of lesion, lymph discharging sinus and disfigurement.

The most preferred modality of treating cystic hygroma remains complete surgical excision; however, many recent case reports and case series have increasingly documented remarkable results for management of such lesions with sclerosant agents.[1–4,18–22] The other treatment modalities that have been employed with variable results include simple drainage, aspirations, radiation, laser excision, radio-frequency ablation and cauterization.[17,18,22]

Surgical excision of the complex cystic hygromas, involving deep and vital structures, is not an easy task. Extreme care has to be followed to avoid peroperative complications. The possible complications during surgery are damage to facial nerve, facial artery, carotid vessels, internal jugular vessels, thoracic duct and pleura, and incomplete excision in case of infiltration to the surrounding structures. The postoperative complications observed after surgical excision of cystic hygroma are wound infection, haemorrhage, hypertrophied scar and lymphatic discharge from the wound. In about 20 % of cases, there is recurrence even after apparent complete excision of the lesion.[1, 18–26].

Other successful and popular treatment option for the management of cystic hygroma is sclerotherapy. Previously, sclerotherapy was carried out with sclerosant agents, such as boiling water, quinine, sodium morrhuate, urethane, iodine tenture, doxycycline and nitromin. However, sclerotherapy with the above mentioned agents has been associated with low success rates and frequent complications.[16,20–24]

Sclerotherapy with intralesional bleomycin, as a primary treatment modality, for cystic hygroma, has been tried. Various case reports and original studies have documented good response to the therapy.[20–23] The other agent used as sclerosant is OK432, has more satisfactory results and less

complications as compared to bleomycin.[20–24]

Bleomycin is a chemotherapeutic agent used in chemotherapy for a number of malignancies. Yura et al. used intralesional bleomycin as sclerosant agent for the first time.[21] It is a DNA synthesis inhibitor and its exact mechanism of action in cystic hygroma is not known; however, it is believed that it may produce a non-specific inflammatory process that results in the fibrosis of the cysts. In about 60% of patients treated with intra-lesional bleomycin, there was complete resolution of the lesion; and in about 30% patients, it caused remarkable reduction in size.[20–24] The same is true in our experience.

Bleomycin can be prepared as aqueous solution or as fat emulsion. Bleomycin is usually given according to the weight of the patient. The recommended dosage is 0.3 mg/kg to 3 mg/kg per session. However, many authors prefer giving bleomycin according to the size of the lesion and not the weight of the patient. Higher dosage is usually associated with complications.[20–24] In our experience, 0.5 mg/kg is a safer dose and can give excellent results. The recommended therapy schedule is fortnightly sessions with intra-lesional bleomycin, and 3-6 sessions have to be given for ultimate results. Some authors suggested weekly sessions for sclerotherapy with bleomycin.[20–24] However, we prefer a minimum interval of three weeks between sessions.

The reported complications of sclerotherapy with bleomycin are discolouration of the injection site, sudden increase in the size of cystic hygroma, fever, vomiting, cellulitis, interstitial pneumonia and pulmonary fibrosis. Pulmonary fibrosis is associated with high dosage of bleomycin. The safe upper limit for dosage of bleomycin in a single session is 30 mg/m2. In published case series, where small doses of bleomycin were used, there was no pulmonary fibrosis in any of their patients.[20–24] In some patients, we have observed an increase in the size of cystic hygroma after few hours of sclerotherapy with bleomycin [Figure 8]. Sometimes the cysts of the lesion reduced in size, but turned very tense and hard. Another cosmetic complication is the persistent firm hard residual lesion after disappearance of all the palpable cysts.

Conclusion:

Cystic hygroma is a manageable lesion in pediatric population. Suitable treatment should be opted based upon case to case variation. Intra lesional application of bleomycin in lymphangioma has a good therapeutic effect with low complication rates. Inspite of surgery and to avoid surgical complication; inj Bleomycin is an alternative, safe, simple and effective method for the patient of cystic hygroma.

Source of Support: Nil

Conflict of Interest: None declared

References

1. Manikoth P, Mangalore GP, Megha V. Axillary cystic hygroma. *J Postgrad Med*. 2004;50:215–6. [PubMed] [Google Scholar]
2. Fonkalsrud EW. Lymphatic disorders. In: Grosfeld JL, O'Neill JA Jr, Coran JA, Fonkalsrud EW, Caldamone AA, editors. *Pediatric surgery*. 6th ed. Chicago: Mosby Elsevier; 2006. pp. 2137–45. [Google Scholar]
3. Sanlialp I, Karnak I, Tanyel FC, Senocak ME, Buyukpamukcu N. Sclerotherapy for lymphangioma in children. *Int J Pediatr Otorhynolaryngol*. 2003;67:795–800. [PubMed] [Google Scholar]
4. Kaur N, Gupta A, Amratash , Singh N. Giant cystic hygroma of the neck with spontaneous rupture. *J Indian Assoc Pediatr Surg*. 2007;12:154–5. [Google Scholar]
5. Kocher HM, Vijaykumar T, Koti RS, Bapat RD. Lymphangioma of the chest wall. *J Postgrad Med*. 1995;41:89–90. [PubMed] [Google Scholar]
6. Dhrif AS, El Euch D, Daghfous M, Cherif F, Mokni M, Dhahri AB. Macrocystic lymphatic lymphangioma (cystic lymphangioma) of upper extremity: A case report. *Arch Pediatr*. 2008;15:1416–9. [PubMed] [Google Scholar]
7. Antoniades K, Kiziridou A, Psimopoulou M. Traumatic cervical cystic hygroma. *Int J Oral*

Maxillofac Surg. 2000;29:47–8. [PubMed] [Google Scholar]

8. Selz PA, Arjmand EM. Laryngeal lymphangioma: a case report of an uncommon entity. *Otolaryngol Headv Neck Surg*. 1998;118:382–4. [PubMed] [Google Scholar]
9. Carpenter CT, Pitcher JD, Jr, Davis BJ, Gomez R, Schofield TD, Youngberg RA. Cystic hygroma of arm: A case report and review of literature. *Skeletal Radiol*. 1996;25:201–4. [PubMed] [Google Scholar]
10. Oak SN, Redkar RG, Kapur VK. Posterior midline cervical fetal cystic hygroma. *J Postgrad Med*. 1992;38:93–6. [PubMed] [Google Scholar]
11. Mansingani S, Desai N, Pancholi A, Prajapati A, Vohra PA, Raniga S. A case of axillary cystic hygroma. *Indian J Radiol Imag*. 2005;15:517–9. [Google Scholar]
12. Arora A, Narula MK, Sonkar P, Chadha R. Cystic hygroma of chest wall. *Indian J Radiol Imag*. 2003;13:120–1. [Google Scholar]
13. Descamps P, Jourdian O, Paillet C, Toutain A, Guichet A, Pourcelot D. Etiology, prognosis and management of nuchal cystic hygroma: 25 new cases and literature review. *Europ J Obstet Gyenecol Reprod Biolog*. 1997;71:3–10. [PubMed] [Google Scholar]
14. Gustavii B, Ecivall H. First trimester diagnosis of cystic nuchal hygroma. *Acta Obstet Gynecol Scand*. 1984;63:377–80. [PubMed] [Google Scholar]
15. Zanotti SD, LaRusso S, Coulson C. Prenatal sonographic diagnosis of axillary cystic lymphangiomas. *J Clin Ultrasound*. 2001;29:112–5. [PubMed] [Google Scholar]
16. Ibrahim AH, Kandeel A, Bazeed MF. Successful non surgical management of a huge life threatening cervicomediastinal cystic hygroma case report and review of the literature. *J Pediatr Surg Specialt*. 2009;3:48–50. [Google Scholar]
17. Sheila S, Nazarian-Mobin, Simms K, Urata MM, Tarczy-Hornoch K, Jeffrey A. Misleading presentation of an orbital lymphangioma. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2010;109:82–5. [PubMed] [Google Scholar]
18. Sobol SE, Manoukian JJ. Acute airway obstruction from a laryngeal lymphangioma in a child. *Int J Pediatr Otorhynolaryngol*. 2001;58:255–7. [PubMed] [Google Scholar]
19. Ameh EA, Nmadu PT. Cervical cystic hygroma: Pre, intra and postoperative morbidity and mortality in Zaria, Nigeria. *Pediatr Surg Int.* 2001;17:342–3. [PubMed] [Google Scholar]
20. Mahajan JK, Bharathi V, Chowdhary SK, Samujh R, Menon P, Rao KL. Bleomycin as intralesional sclerosant for cystic hygromas. *J Indian Assoc Pediatr Surg*. 2004;9:3–7. [Google Scholar]
21. Yura J, Hashimoto T, Tsuruga N. Bleomycin treatment for cystic hygroma in children. *Arch Jpn Chir*. 1977;46:607–14. [PubMed] [Google Scholar]
22. Okada A, Kubota A, Fukuzawa M, Imura K, Kamata S. Injection of bleomycin as a primary therapy of cystic lymphangioma. *J Pediatr Surg*. 1992;27:440–3. [PubMed] [Google Scholar]
23. Orford J, Barker A, Thonell S, King P, Murphy J. Bleomycin therapy for cystic hygroma. *J Pediatr Surg*. 1995;30:1282–7. [PubMed] [Google Scholar]
24. Zhong PQ, Xhi FX, Li R, Xue JL, Shu GY. Long-term results of intratumorous bleomucin-A5 injection for head and neck lymphangioma. *Oral Surg Oral Med Oral Pathol Oral Radiol Endodnone.* 1998;86:139–44. [PubMed] [Google Scholar]
25. Ogita S, Tsuto T, Nakamura K, Deguchi E, Tokiwa K, Iwai N. OK-432 therapy for lymphangioma in children: Why and how does it work? *J Pediatr Surg*. 1996;31:477–80. [PubMed] [Google Scholar]
26. Katsuno S, Ezawa S, Minemura T. Excision of cervical cystic lymphangioma using injection of hydrocolloid dental impression material, a technical case report. *Int J Oral Maxillofac Surg*. 1999;28:295–6. [PubMed] [Google Scholar]
27. Bozkaya S, Ugar D, Karaka I, Ceylan A, Uslu S, Baris E, et al. The treatment of lymphangioma in the buccal mucosa by radiofrequency ablation: a case report. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*. 2006;102:28–31. [PubMed] [Google Scholar]