MRI OF CONGENITAL SUB-GLOTTIC HEMANGIOMA : A CASE REPORT

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ABSTRACT

Sub-glottic hemangioma is generally a benign lesion which causes upper airway obstruction and dyspnea. We reported MRI findings in a case of sub-glottic hemangioma. A 2 month-old Thai girl presented with progressive dyspnea and upper airway obstruction secondary to a mass on the left side of the sub-glottic trachea. Conventional radiographs, CT scan of the neck and indirect laryngoscopy prior to MRI study failed to reveal the presence of the lesion. Repeated laryngoscopy after MRI scan showed a mass in the sub-glottic trachea corresponded to the MRI findings. Hemangioma was diagnosed because this child also had cutaneous hemangioma in the occipital region. The potential lethal nature of these lesions was emphasized.

INTRODUCTION

Congenital sub-glottic hemangioma is generally a benign lesion which causes progressive airway obstruction secondary to a mass of hemangioma involving the sub-glottic trachea (1-4). The airway obstruction may result in deaths in infants. The lesion usually can be seen on a lateral neck radiograph as narrowing of the trachea. Conventional roentgenogram of the neck in AP view may show asymmetrical narrowing of sub-glottic trachea but most of the times, the lesion will not be well appreciated by this modality of imaging. The lesions will not be readily demonstrated on CT scan (5-6). These patients require careful evaluation since smaller airway manifests a much greater potential for obstruction. The most common site of sub-glottic hemangioma is immediately below the true vocal cords. Differentiation from other tumors must be made during evaluation. Treatment is dependent on size, location, and degree of respiratory compromise.

CASE REPORT

The patient was a 2 month-old Thai girl who presented at Ramathibodi hospital in April 1995 with a 5 day history of progressive dyspnea. The child had no fever, stridor, dysphagia or trauma.

Physical examination was significant for an upper airway obstruction. Pertinent vital signs were a respiratory rate of 40 per minute and a temperature of 37.0°C. AP and lateral films of the neck, chest roentgenogram and barium swallowing showed no evidence of intra-luminal mass lesion in the trachea (Fig.1-3).

Indirect laryngoscopy revealed no evidence of intra-luminal mass lesion in the trachea. The child was intubated with a No. 3.5 endo-tracheal tube. Admission laboratory data revealed a WBC count of 6100 and admission cultures grew few colonies of normal flora. The child was given humidified oxygen by using an oxygen box. Adrenalin was also given but the symptoms were not improved.

Ultrafast computed tomography of the neck was performed using Imatron C-150. Axial scans were done with a 3 mm. slice thickness. The study demonstrated no intra-luminal mass lesion in the trachea (Fig. 4)

MRI was performed with a 1.5 Tesla superconducting magnet (GE Signa, MRS 2000), using a neck coil. The spin echo technique was used with a repetition time of 400 ms. and an echo time of 16 ms. (400/16) for T1-weighted images and gradient echo technique was used for T2-weighted images with the flip angle of 25° and 519/20 (TR/TE). Four signals were averaged for both T1

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and T2 weighted imaging. Axial T1WI were obtained with and without contrast agent (0.1 mmol/ml/kg Gd-DTPA) The study was done in coronal, sagittal and axial planes. The section thickness was 3 mm with 0.1 mm inter-section gap, and data were collected using a 256 X 192 matrix. The study demonstrated a 0.8 X 0.4 X 0.4 cm. oval shaped, nodule at left postero-lateral part of sub-glottic trachea with a markedly compromised airway (Fig. 5A - E). The lesion bulged locally into sub-glottic laryngeal lumen. It showed faint increased signal intensity when compared with the muscles on T1 weighted images, while on T2 weighted images it showed marked hyperintensity. Homogeneous contrast enhancement of the lesion is seen after gadolinium injection. The nature of this lesion is most likely a hemangioma because the child also had a cutaneous hemangioma at her occipital region (7). Findings corroborated the work of Rao et al. (8) and Hoh et al (9).

Repeated indirect laryngoscopy at this fime revealed a small red mass at left postero-lateral wall of sub-glottic trachea just below the true vocal cord. The child was treated with steroid and all the symptoms were gradually improved, and was symptom free at the last follow up in September 1995. There was no evidence of recurrence of symptoms nine months post steroid treatment.

DISCUSSION

Congenital sub-glottic hemangioma usually causes partial airway obstruction within the first six months to a year. They may go untreated if asymptomatic. Their incidence is unknown. The sub-glottic segment of the larynx is that portion bounded by the true vocal cords superiorly and the lower margin of the cricoid cartiliage inferiorly (10). Presenting symptoms vary with lesion size, age and extension into airway. Infants, because of their small tracheal lumen, may present with dyspnea and labored breathing, stridor or difficulty in feeding (11). Occasional complaints of hoarseness or other voice alterations are more commonly seen, but these symptoms were not present in our reported case, probably due to small sized lesion.

This case report typifies sub-glottic hemangioma. The lesion is not demonstrated by any imaging modality other than MRI in this case. MRI was performed to exclude intra-luminal tracheal mass lesion and/or determine the extent of the lower airway involvement(12-13). The diagnosis is supported by the presence of associated cutaneous hemangioma, presenting symptoms, physical examination and other radiological imaging. Presence of the lesion was confirmed by the repeated laryngoscopy. MRI is better than other imaging modalities due to its multiplanar capability (14). An awareness of the signal intensity from the lesion on MRI, the morphology and site of lesion as described may aid in recognition of these lesions. The differential diagnoses include laryngeal papilloma, adenoma, neurofibroma, rhabdomyoma and chondroma. Laryngeal papilloma usually arises at the vocal cord and multiple lesions are common. The tumor usually shows wart-like appearance with low signal intensity on T1WI and high signal intensity on T2WI. The adenoma will be a mass lesion similar to laryngeal carcinoma in the adult. Neurofibroma usually shows infiltrative abnormality involving the extra-laryngeal neck and paraglottic structures. Rhabdomyoma will appear as a mass lesion. Chondroma is usually found close to cartilagenous structures. Calcification is frequently found in chondroma and will be clearly seen on CT scan.

In 1995, Nozawa et al (15) reported the first case of MRI findings in sub-glottic hemangioma. Their case is similar to ours. To our knowledge, our case is the second case to be reported in the literature.

In the management of such a case, a tracheostomy may be necessary to maintain an adequate airway in some case but was not performed in our case due to small sized lesion. Decompression treatment of the mass was not done because there is a high risk of bleeding complication. We felt that removal with laryngeal instruments or laser surgery would have been time consuming and difficult because of the nature of the lesion and the risk of local bleeding. Radiation therapy was used in the past but is now rarely performed. However, the lesion is common to regress spontaneously.

For the line of investigation in children with an upper airway obstruction, the sequence of investigation presented in this case is quite appropriate. Although MRI was the only imaging modality that was able to demonstrate the intra-luminal lesion of sub-glottic trachea in our case; we should not begin the investigation with MRI in children with upper airway obstruction, because of the high cost of the study. Conventional AP film of

the neck with high KV technique and the use of a filter will readily demonstrate most of the tracheal lesion. However, in difficult cases, MRI would be very helpful as in our reported case (16-18).

REFERENCES

1. Jones SR, Myers EN, Barnes EL. Benign neoplasms of the larynx. In: Fried MP, ed, The larynx: a multidisplinary approach. Boston, Little Brown & Co, 1988:401-20.
2. Hugh D, Curtin. The larynx. In: Som PM and bergeron RT, eds, Head and neck imaging excluding the brain : St. Loius. The CV Mosby Co, 1991:593-692.
3. William N, Hanafee and Paul H Ward. Clinical correlation In : The head and neck volume 1. The larynx. Thieme Med Publi, Inc. 1990:1-81.
4. Lahoz - Zamarro - MT, Roya - Lopez - J, Valero - Ruiz -J, Camara - Gimenez - F, Urbiola - E. Cavernous hemangioma of the larynx in the adult. A propose of a case. Acta-Otorhinolaryngol - Esp. 1989;40(2):141-44.
5. Cohen EK, Kressel Hy, Perosio T. MR imaging of soft tissue hemangiomas: Correlation with pathologic findings. AJR 1988;150:1079-81.
6. Kassel EE, Keller MA, Kucharczy K. MRI of the floor of the mouth, tongue and orohypopharynx. Radio Clin North Am. 1989;27:131-351.
7. Maffee MF, Compos M, Raju S. Head and neck high field MRI versus CT. Otolaryngol Clin North Am. 1988;21:513-46.
8. Vijay M Rao, Adam E. Flanders, Barry M Tom. MRI and CT. Atlas of correlative imaging in otolaryngology. London, Martin Duvitz Ltd, 1992:127.
9. Hoh K, Nishimura K, Toyashi K. MR imaging of cavernous hemangioma of the face and neck. J Comput Assist Tomogr 1986;10(5):831-5.
10. Lawson W and Biller HF. Glottic and sub-glottic tumors. In: Thawley SE and Panje WR, eds, Comprehensive management of head and neck tumors. Philadelphia: WB Saunders Co, 1987:991-1015.
11. Lufkin BB, Lawson SG, Hanafee WN. Work in progress: NMR anatomy of the larynx and tongue base. Radiology 1983;148:173-5.
12. Lufkin R, Hanafee W, Wortham D. Magnetic resonance imaging of the larynx and hypopharynx using surface coils. Radiology 1986;158:747-54.
13. R. Nick Bryan, Charles W Mc Cluggage, Barry L. Horowitz, David Jenkins. The normal and abnormal neck. In: Richard E Latchaw, ed, MR and CT imaging of the head and neck and spine. St. Louis: Mosby. Year Book Inc, 1991:1035-67.
14. Louis M Teresi, Robert B Lufkin, Willam N Hanafee. Magnetic resonance imaging of the larynx. Radio Clin North Am. 1989;27:393-406.
15. K. Nozowa, T. Aihara, H. Takano. MR imaging of a sub-glottic hemangioma. Pedia Radio 1995;25:235-6.
16. Stephen F. Simoneaux, Estelle R. Bank, Joel B Webber, W. James Parks. MR imaging of the pediatric airway. Radiographics 1995;15(2):287- 9.
17. Griscom NT. Diseases of the trachea, bronchi and small airways. Radio Clin North Am 1993;31:605-15.
18. Hernandez RJ, Tucker CF. Congenital tracheal stenosis:role of CT and high KV films. Pedia Radio 1987;17:192-6.

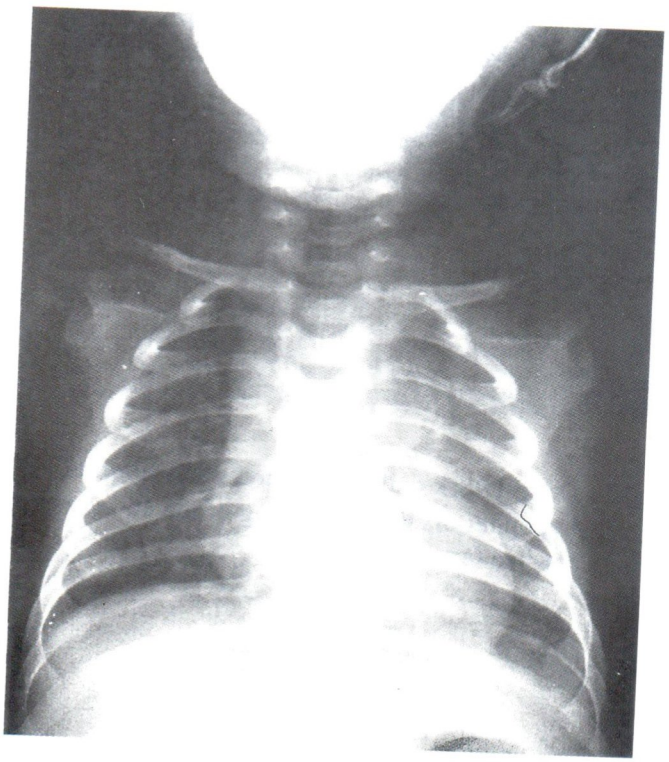

Fig.1 AP chest roentgenogram includes the neck showed no abnormalities.

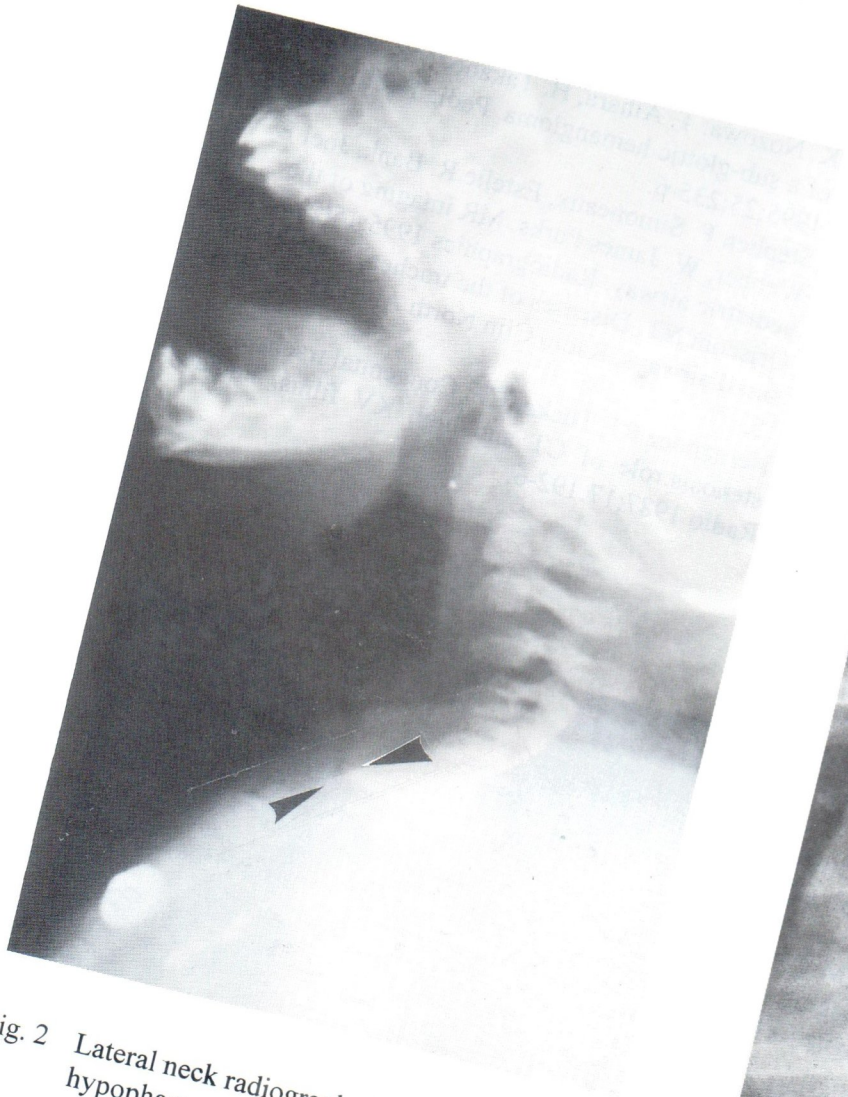

Fig. 2 Lateral neck radiograph shows distention of hypopharynx and narrowing of the sub-glottic trachea (arrow-heads).

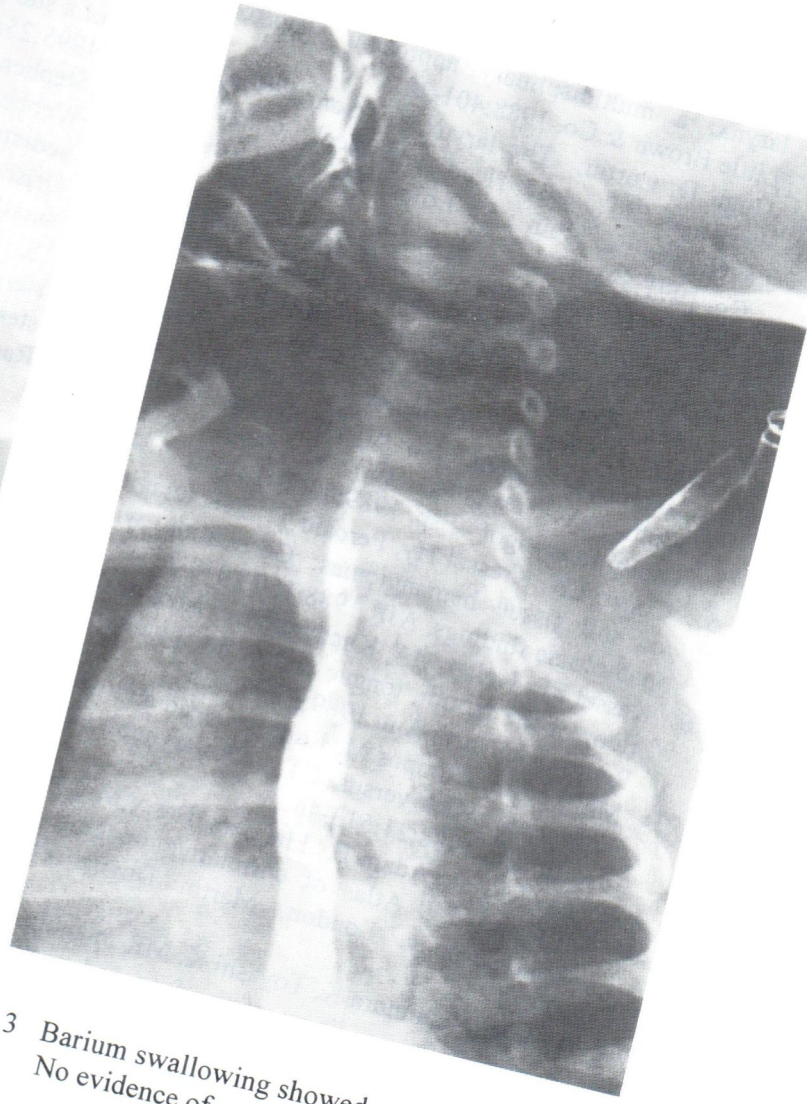

Fig. 3 Barium swallowing showed no abnormalities. No evidence of a vascular ring was demonstrated

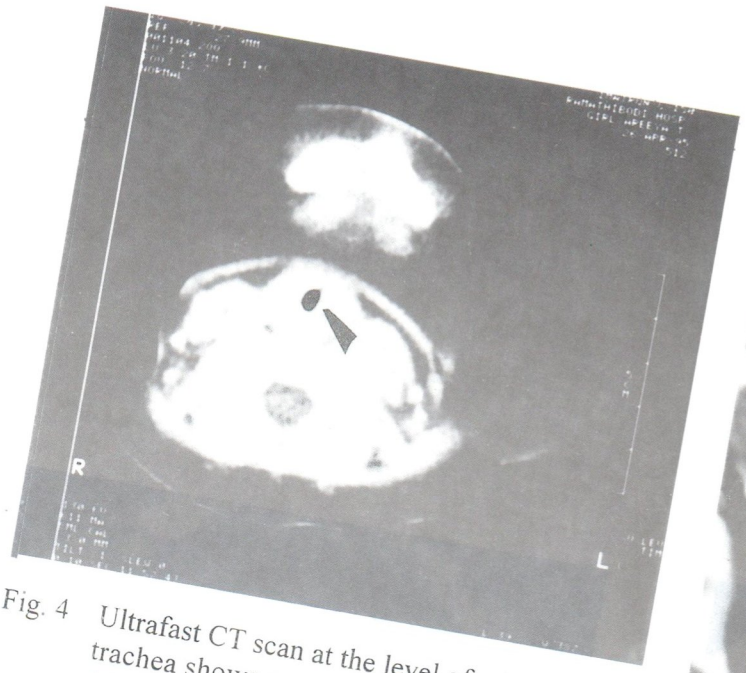

Fig. 4 Ultrafast CT scan at the level of sub-glottic trachea shows no intra-luminal mass lesion. Although asymmetry of sub-glottic trachea is seen (arrow-head).

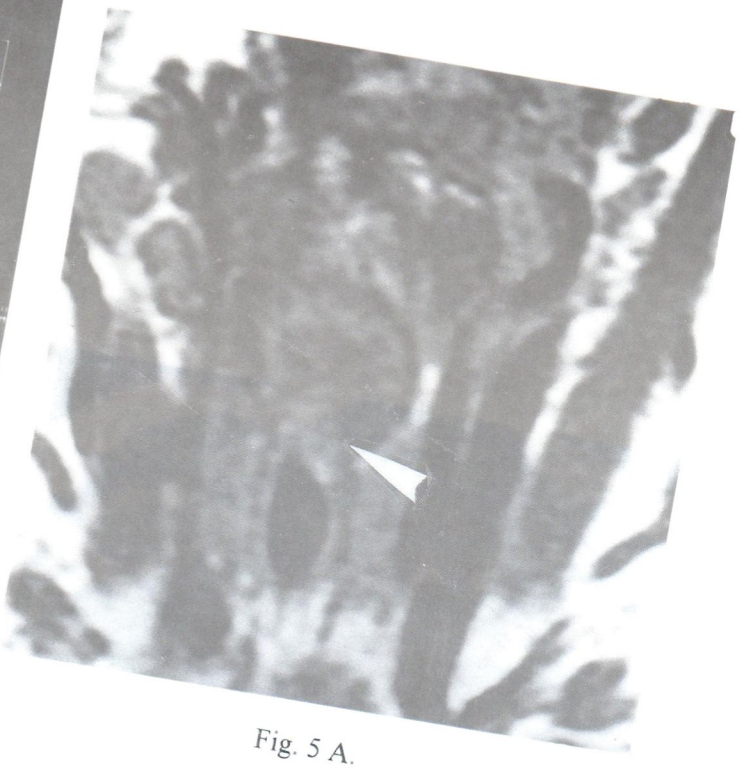

Fig. 5 A.

Fig. 5 B.

Fig. 5 C.

Fig. 5 A-C. MR imaging of the neck (A-C) in coronal, sagittal and axial T1WI showed an oval shaped, slightly hyperintense mass arising from left postero-lateral wall of sub-glottic trachea (arrow-heads).

Fig. 5 D. Axial T1WI obtained after administration of GD-DTPA, the lesion is seen as a homogenously enhancing mass encroaching upon the sub-glottic tracheal lumen (arrow-head).

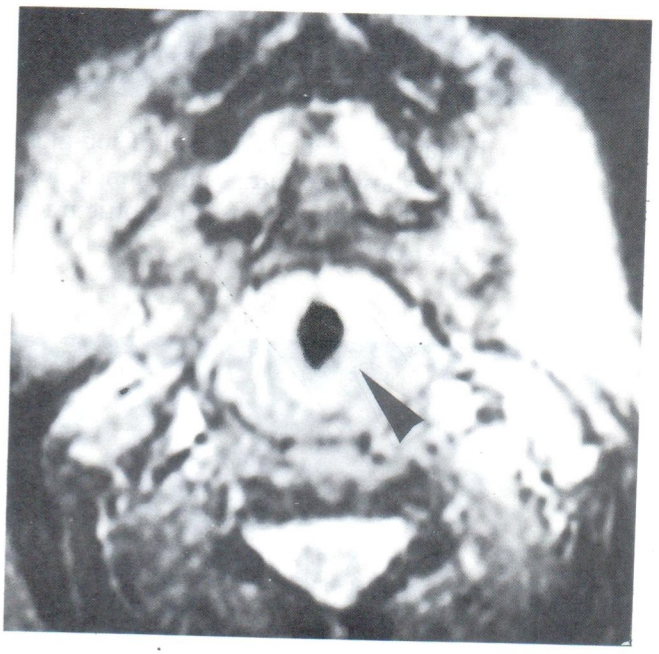

Fig. 5 E. Axial T2WI shows ahyperintense mass lesion at left posterolateral aspect of sub-glottic trachea (arrow-head).