Bahrain Medical Bulletin, Vol. 27, No.3, September 2005

Laryngeal Amyloidosis

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Localized amyloidosis of the head and neck is a rare and benign disease of unknown nature. It affects males slightly more than females, between 40 – 60 years of age. Laryngeal amyloidosis is a very rare disease, accounting for less than 1% of all benign laryngeal tumors. It is characterized by the deposition of a homogeneous eosinophilic extra-cellular material in the laryngeal tissues, this material is of a protein in nature. We report a female, middle aged, who presented with dysphonia and was found to have an isolated laryngeal amyloidosis. The report discusses the presentation, diagnosis, treatment with endoscopic carbon dioxide laser, the nature of the recurrence of the disease, and the need for the long term follow up to rule out any evidence of local recurrence and / or development of systemic involvement.

Key Words: Amyloidosis, Laryngeal, Carbon dioxide laser.

Bahrain Med Bull 2005;27(3): 94-98

Amyloidosis was first well described by Rokitansky in 1842. Virchow, who gave amyloid its name, found that it stained violet with iodine and sulphuric acid and he attributed this to its cellulose or starch like nature[1]. Laryngeal amyloidosis is a rare disease, it was first documented in 1875[2]**.** The entire upper portion of the airway, and tracheobronchial tree must be examined to determine the extent of the lesion. Also, a search must be made for evidence of systemic amyloidosis or other localized deposits[3]. A case of an isolated laryngeal amyloidosis is presented, its management, treatment with Carbon dioxide laser, and follow up are discussed.

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THE CASE

An Asian female, non-smoker, aged 38, married, with two children. Referred to the author who is the in-charge of the voice clinic at Salmaniya Medical Complex from American Mission Hospital on the 25th of October 2000, complaining of dysphonia for seventeen months. The patient's symptoms were of gradual onset, but slowly progressive. She had no history of shortness of breath, or stridor. She underwent a tubal ligation in 1986 and myomectomy in 2000 due to fibroid uterus.

The general examination showed a good general condition, not dyspnic or tachypnic. Her vital signs were normal and no palpable lymph nodes in the neck. Indirect laryngoscopic examination of the larynx showed a smooth pinkish swelling of the right false vocal fold covering the right true vocal fold, but a normal mobile left vocal fold. The video laryngostroboscopic examination has confirmed the same findings. Ears, nose, throat and tongue examination were normal. Blood biochemistry, liver function tests, thyroid function tests, C-reactive proteins, ECG and chest X-ray were normal. The CT scan of the neck with Omnipaque contrast showed a localized enhancing soft tissue mass measuring 1x 0.7cm in diameter of the right vocal fold. Thickening of the right vocal fold as compared to the left vocal fold.

On the 25th of December 2000, microlaryngoscopy was preformed under general anesthesia, the lesion was biopsied, and the pathology report showed a partly polypoidal lesion lined by respiratory epithelium and stratified squamous epithelium. The sub epithelial zone revealed a pale pinkish amorphous to fibrillary material and focal to patchy clusters of plasma cells and occasional foreign body giant cells reaction. Mucus glands are incarcerated by this pale material. PAS negative for mucin. Congo red stain showed patchy congophilia and characteristic green birefringence under polarized light, and there was no neoplastic pathology. All these features are suggestive of amyloidosis of the larynx.

On the 14th of May 2001, endoscopic resection of the lesion was preformed using carbon dioxide laser; the power emission was set between 2 and 5 watts in pulsed mode. Convincing the patient to sign the consent form was the reason for the delay in starting the treatment. In August 2001 and in January 2002, the patient underwent repeated micro-laryngoscopies under general anesthesia. Recurrence of the same lesion at the same site was ablated using carbon dioxide laser. She is now under regular follow up every six months in the voice clinic to check her voice quality, and perform video laryngostroboscopy to rule out any evidence of local recurrence.

DISCUSSION

Amyloidosis is a disorder of protein metabolism in which autologus proteins are deposited intracellular as fibrils [4]. Systemic amyloidosis occurs in four different clinical settings[5]:

1. As a complication of immunocyte dyscrasia, the fibrils are derived from immunoglobulin light chains and the constituent protein designated AL (A: Amyloid, L: Light chain).

2. Associated with chronic inflammatory or infectious disease, the fibrils (designated AA) are derived from the acute-phase reactant serum amyloid protein.
3. As a familial disorder, fibrils derived from genetic variant forms of pre-albumin.
4. In up to a quarter of aged individuals. Fibrils derived from plasma pre-albumin.

Primary amyloidosis is a deposition of amyloid principally in the mesenchymal tissues, tongue, heart, gastrointestinal, etc. without an underlying predisposing disease[6] . Thomson et al at the Armed Forces Institute of pathology in Washington, DC, conducted histological, histochemical, and immunohistochemical reviews of laryngeal amyloidosis in three women and eight men, and their conclusion suggests that some laryngeal amyloidosis may be the result of an immunocyte dyscrasia or tumour of mucosa-associated lymphoid tissue[7].

The most frequent site in the upper air passage is in the larynx, the next most common locations are the base of the tongue, trachea, nasal cavity, and pharynx. In the larynx, the sites of preferences in order of frequency are: true vocal folds, laryngeal ventricles, false vocal folds, aryepiglottic folds, and subglottic space. The lower trachea and bronchi are less commonly involved than the subglotic trachea[8].

Primary amyloidosis is a disease of the elderly occurring between the fifth and seven decades, and affects males more often than females, with a ratio of 3:1.

A primary laryngeal amyloidosis in an eleven years old girl was reported in Brazil 1999 and a primary nasal amyloidosis in a ten years old girl was reported in Singapore 2001[9,10].

The most common head and neck presentations are hoarseness, nasal congestion, odynophagia, articulation problems, mandibular deformities, deglutition difficulties, airway obstruction, speech disorders and hypogeusia[11].

In the CT scan, amyloidosis is demonstrated as a marked thickening of he laryngeal structures with high density as measured with Hounsfield numbers. MRI has not been done, but the signal characteristic of amyloid in MRI resembles those of skeletal muscles, the structure of amyloid is similar to the highly organized, multilayered, myofibrillar ultra structure of skeletal muscle, this may be an important differentiating point because muscle is an easy reference frame, and tumors do not appear in this manner on MR images[12].

Histologically amyloid is usually seen as extra cellular, acellular, amorphous, frequently with a perivascular and periglandular distribution, and it is located in the superficial lamina propria (Reinke's space), and in the deeper parts of the larynx[13]. This explains the smooth appearance of the lesion macroscopically. It is recommended that at least one biopsy should be taken from a different site of the body, preferably the rectum or abdominal subcutaneous fat tissue[13]. Such biopsy was not performed in our case because of no consent.

Treatment of amyloidosis proposed in the literature are based on:

1. The use of steroids, immunosuppressant and radiation therapy. These treatments had unsatisfactory results and are now completely abandoned.
2. Treatment of symptomatic lesions only[14].

At present, most authors agree on surgical treatment of laryngeal amyloidosis, however, the type of surgery to be performed remains controversial. Some authors suggested the need for an external approach to remove the entire lesion radically; others strongly support endoscopic carbon dioxide laser surgery, pinpointing the advantages of this procedure, in terms of functional outcome, as compared to conventional external approaches[14]. Biopsy specimens are preferably removed by cold endoscopic excision. The specimens can be examined more minutely if no carbonization is present. Surveillance may be indicated in selected cases, because there may be slow or no progression of the disease over many years. Localized amyloidosis has an excellent prognosis in comparison to the systemic type. Long term follow up for of 10 years is essential because of the slowly progressive nature of the disease and the risk of long term complications such as airway obstruction[15].

CONCLUSION

Laryngeal amyloidosis is a rare and benign condition. Systemic involvement should be ruled out. Endoscopic carbon dioxide laser allows a radical resection of localized laryngeal amyloidosis, and surgery must be followed by regular micro-laryngoscopies to rule out local recurrence. Local amyloidosis has an excellent prognosis to the systemic type. Yearly follow up is recommended for at last 10 years and should be focused on possible development of systemic disease.

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