CLINICAL PRACTICE

Treatment of laryngeal lipoid proteinosis using CO_2 laser

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Lipoid proteinosis (Urbach-Wiethe disease, hyalinosis cutis et mucosae) is an autosomal-recessive condition with variable penetrance. It is characterised by distinctive skin and mucous membrane lesions, particularly on the eyelids, on the extensor surface of large joints and in the mouth. Laryngeal involvement is typical and causes hoarseness due to lesions on and around the vocal cords and occurs in 75% of patients with the condition.[1] Patients are normally hoarse from infancy, and a chronic and benign course is usual.[2] Lesions are found in the interarytenoid areas and on the aryepiglottic folds. Later, the true and false cords may be involved and airway compromise may develop.[3] Excision of the lesions using microlaryngoscopy instruments has been shown to improve the airway and quality of the voice. Rarely, tracheostomy has been required to ensure a safe airway.[4,5] There is no proven treatment for lipoid proteinosis. Although both oral dimethyl sulphoxide and oral etretinate have shown promising results, recent case reports have found them to be ineffective.[6] CO_2 laser has been used successfully to treat eyelid deposits in lipoid proteinosis, but to the best of our knowledge it has not previously been used to treat laryngeal deposits.[7]

Case report

A 34-year-old man with the surname of Cloete, from Okiep in Namaqualand, Northern Cape (600 km from Cape Town), previously proven on DNA testing to have lipoid proteinosis, was referred to the ENT Department at Tygerberg Hospital, Cape Town, for an assessment of his airway and possible tracheostomy. He had been hoarse since early childhood but had developed stridor 3 months before his referral. He is an epileptic on carbamazepine and smokes 40 cigarettes a day. His brother is also hoarse but has no airway difficulty.

On examination, he had typical lipoid proteinosis skin lesions on the eyelids, the back of the hands, the elbows and the sacrum. He had inspiratory and expiratory stridor, but did not have other signs of respiratory distress. Cardiorespiratory, abdominal and neurological examinations were otherwise normal. Fibreoptic laryngoscopy was performed, which revealed a compromised airway with florid lipoid proteinosis deposits throughout the supraglottic, glottic and subglottic areas and involving both vocal cords. The right vocal cord was fixed and the left vocal cord movement was reduced.

Microlaryngoscopy was performed under general anaesthetic and a biopsy was taken, confirming the diagnosis of lipoid proteinosis of the larynx (Fig. 1). Hyperplastic squamous epithelium with an underlying fibroblastic stroma was found. Deeper cuts showed hyaline material arranged around blood vessels and glands. A Congo red stain (for amyloid) was negative and a PAS stain (for mucin) was positive (Fig. 2).

A staged procedure of laser excision/vaporisation of the lesions causing airway obstruction was performed using a CO_2 laser (Sharplan 4000, Sharplan Industries, Tel Aviv, Israel). The superpulse facility was used at 10 watts. Spot size was adjusted according to cutting or coagulation requirements. Initially the left side of the larynx was treated, significantly reducing the patient's stridor. Two weeks later he was again examined under anaesthetic and the right side of the larynx was treated. Postoperatively he had a much-improved airway with no stridor, although his voice remained hoarse. Follow-up was telephonic because of his unwillingness to travel the large distance between his home and the hospital. He presented

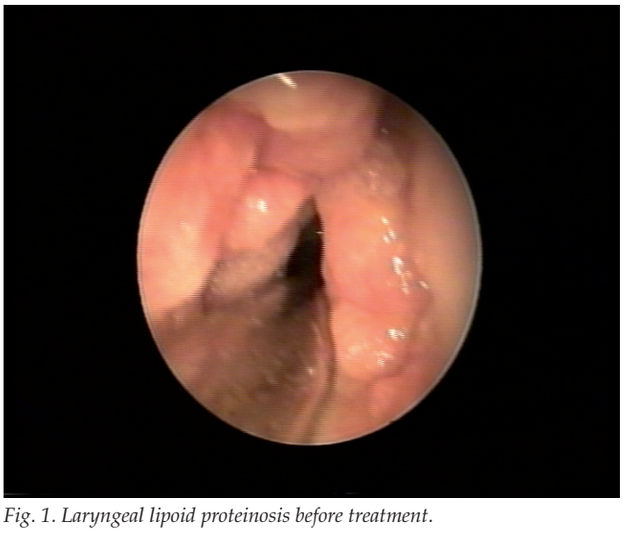

Fig. 1. Laryngeal lipoid proteinosis before treatment.

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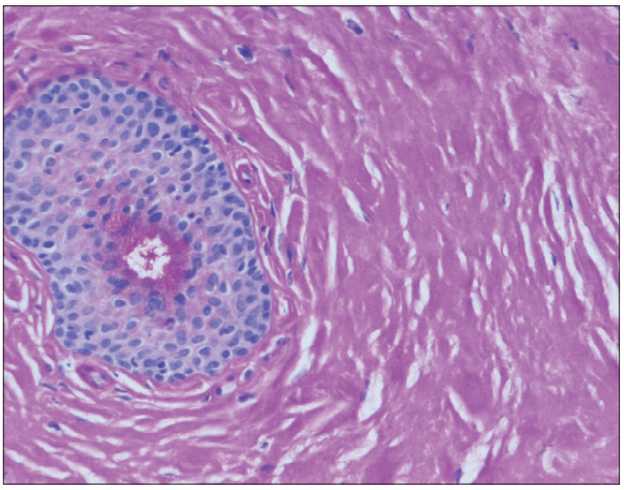

Fig. 2. PAS stain showing mucin deposition and hyaline material.

with mild stridor 2 years and 6 months postoperatively and requested a second treatment. This was done in the same way as the first, again with significant improvement in the airway. Until this presentation, he had had no recurrence of his stridor and had not sought medical attention for breathing difficulties.

Discussion

Urbach and Wiethe first described the condition in Germany in 1929, but it is estimated that 25% of cases occur in South Africa, particularly in the Namaqualand region in the towns of Concordia, Okiep, Nababeep and Springbok. This is because of the 'founder effect', where a condition, rare in the original population, is carried to a new area by migration of one or more individuals within a small group and therefore becomes more common in the new population. The original carrier of this condition has been found to be one Jacob Cloete, a German immigrant to the Cape in 1652. His great-grandson Gerrit Cloete migrated to Namaqualand in 1742 and intermarried with the inhabitants of the area.[1] As the area is somewhat isolated, consanguineous marriages were relatively common, leading to a relatively high proportion of homozygous affected individuals.[1,2]

The condition is caused by the recently discovered Q276X mutation in the extracellular matrix protein 1 gene (ECM1) and maps to chromosome 1q21.[8] There is a primary perturbation in collagen metabolism resulting in the deposition of hyalin material in blood vessel walls and extracellular spaces. Calcific deposits in the hippocampal gyri of the temporal lobes cause epilepsy in 20% of cases and may also cause *déjà vu* experiences and hallucinations. Rare features include atrophic scars, and oesophageal, rectal and anal involvement. Parotid duct obstruction has been described. There is an association with diabetes and hypercholesterolaemia.[1]

Although laser has never been used for the laryngeal lesions, it seems to be an ideal treatment modality for this purpose. The CO_2 laser is used extensively for both benign and malignant conditions of the larynx, including laryngeal cysts, polyps, nodules, papillomas, granulomas and carcinomas. It allows accurate excision of lesions under microscopic control, with minimal injury to surrounding normal tissue. Its safety and efficacy for endolaryngeal use is well established.[9,10] Its proposed use here would be most analogous to its use in juvenile laryngeal papillomatosis, where it is internationally accepted as the treatment of choice.[10] Laser is preferable to surgical excision of laryngeal lesions because it is more precise and there is less bleeding as the laser coagulates while cutting.[9]

We propose that the CO_2 laser is an ideal treatment modality for laryngeal lipoid proteinosis, for the reasons given above, and should be the treatment of choice in cases where airway compromise makes surgical treatment necessary.

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