Metastatic calcification of the true vocal folds in the setting of renal failure

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INTRODUCTION

Diagnosis and management of leukoplakia of the vocal folds may present the clinician with a number of challenges. The primary concern must be to rule out malignant or pre-malignant lesions, but other processes may lead to the formation of leukoplakic lesions. One rarely-described cause of leukoplakia is metastatic calcification. In this condition, calcium deposits are most often seen in the skin and visceral organs, but a few reports of laryngeal involvement exist in the literature.

CASE REPORT

A 52-year-old gentleman with a history of end-stage renal disease and tobacco abuse presented to clinic with complaints of dysphagia, cough and subtle voice changes. At the time of presentation, the patient was undergoing hemodialysis on a regular basis. Transnasal fiberoptic laryngoscopy revealed bilateral patches of leukoplakia on the anterior third of his true vocal cords (Figure 1).

The patient was treated conservatively with a proton pump inhibitor and serial laryngoscopic examinations, throughout which the lesions were noted to be slowly enlarging. After three months of conservative management (Figure 2), it was determined that an excisional biopsy should be performed to rule out dysplasia or malignancy.

The patient underwent micro suspension direct laryngoscopy with microflap excision of the bilateral vocal cord lesions. The intra-operative appearance of these lesions was suspicious, but the vocal ligament was not involved and the lesions were removed without difficulty. The patient tolerated surgery well and was discharged home on the day of the procedure.

Surgical pathology revealed benign squamous mucosa with calcinosis, parakeratosis, and submucosal hyalinization. Linear deposits of densely basophilic material were noted in the subepithelial portions of the specimen, characteristic of metastatic calcification.

Review of the patient’s medical records confirmed ongoing phosphorus dysregulation. The patient’s nephrologist was notified of these findings, and his phosphorous levels were managed through his ongoing dialysis.

At his recent nine-month follow-up visit, the patient stated that all dysphonia and dysphagia had resolved. Flexible fiberoptic laryngoscopy showed an absence of any distinct lesions.

DISCUSSION

Metastatic calcification is a process that occurs in patients with end stage renal disease (ESRD), by which dysregulation of serum calcium and phosphorous leads to calcium deposition in various tissues throughout the body. The mechanism through which this occurs is well-described in the literature, beginning with decreasing renal function and an associated drop in the renal excretion of phosphorous. The free serum phosphorous binds calcium, leading to hypercalcaemia. In response, the parathyroid glands are stimulated to produce additional parathyroid hormone, leading to secondary hyperparathyroidism. Excess calcium-phosphorous precipitates may eventually form and deposit in various tissues throughout the body. This condition most commonly affects the skin, blood vessels, joints, heart, lungs, kidneys, breasts, and eyes.1, 2, 3, 4, 5, 6, 7

To our knowledge, there have only been two other reported cases of metastatic calcification to the larynx. In one case published in 1994, the authors describe an exophytic, non-ulcerated vocal cord mass in a 44-year-old female on hemodialysis.2 A second case was identified in 2009, involving a 35-year-old man with ESRD and secondary hyperparathyroidism who presented with hoarseness and was found to have a small papillary lesion of the right vocal fold, concerning for malignancy.2 As for our patient, metastatic calcification was not initially suspected in these two cases, highlighting the difficulty in making this diagnosis.

The previously-reported cases of metastatic laryngeal calcification described lesions characterized by subepithelial deposits of calcium, consisting of densely basophilic, amorphous material.2, 3 In one of the previous cases, a distinction also had to be made between metastatic calcification and papillary thyroid cancer using immunohistochemical staining.3

In our case, the patient’s dysphonia and dysphagia resolved with microsurgical excision of these lesions and improved management of his phosphorous levels.

CONCLUSION

Metastatic laryngeal calcification is a rare diagnosis, but should nonetheless be a part of the otolaryngologist’s differential in patients with ESRD and hoarseness. A tissue diagnosis is especially important in this group of patients, as the similarities in appearance between metastatic calcification and malignancies such as squamous cell carcinoma could potentially lead to inappropriate treatment and increased patient morbidity.

REFERENCES

