Recurrent foreign body granuloma with airway obstruction: Is there a role for steroids?

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Foreign body granuloma is a well-recognized complication of thoracic surgery and is usually managed by removal of the inciting agent. We describe a rare case of recurrent granuloma formation causing significant airway obstruction despite tracheal surgery, airway stenting, and repeated bronchoscopic resections in which the use of systemic steroids eventually led to granuloma regression, obviating the need for further intervention.

Clinical Summary

A 59-year-old man underwent right pneumonectomy for non-small cell lung cancer. Five years later, he presented with progressive dyspnea. Fiberoptic bronchoscopy revealed a nodule over the pneumonectomy stump with 30% occlusion of the left main bronchus. Histology of the resected specimen showed chronic inflammation, and the patient declined further investigations. However, he became dyspneic again 7 months later and acceded to repeat bronchoscopy, which showed a new nodule of similar appearance at the same site. Tracheal resection was performed, with histology suggestive of inflammatory granuloma at the origin of prior suturing. The results of microbiologic tests for tuberculosis were negative.

Over the next 12 months, he experienced repeated episodes of airway obstruction due to recurrent granuloma causing between 30% and 100% airway occlusion (Figure 1), despite 7 bronchoscopic resections and the adjunctive use of topical mitomycin. As a last resort, a modified inverted Y-shaped silicone stent was deployed by means of rigid bronchoscopy across the carina to cover the suture line. Nonetheless, his symptoms recurred barely a week later, and bronchoscopy revealed extensive granulation tissue over the proximal origin and distal end of the left arm of the Y-stent (Figure 2, A). After a final attempt at bronchoscopic resection, a trial of systemic steroids was commenced at $0.5 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ for a month and tapered over 3 months to a maintenance dose of 5 mg every other day. This resulted in significant regression of granulation tissue (Figure 2, B).

Discussion

Foreign body granuloma commonly arises at a site of a previous intervention, where foreign material,^{1,2} such as buttressing tissue, su-

Figure 1. Recurrence of granuloma at the tracheal suture line, causing ball-valve effect luminal occlusion.

tures, staplers, or stents, might provoke a specialized inflammatory response in a predisposed individual.³

The inciting agent might not always be demonstrable in a histologic specimen. In our patient the mere presence of foreign material provoked extensive granulation tissue formation with significant airway obstruction, necessitating repeated interventions. Unfortunately, these interventions in themselves can sometimes perpetuate a cascade of inflammation, healing, and further elaboration of granulation tissue. It is noteworthy that despite their reputation as relatively inert material, silicone stents² have been implicated in the pathogenesis of foreign body granuloma.

Systemic steroids have been widely used to treat immune-mediated granuloma, such as sarcoidosis⁴; their role in managing foreign body granuloma is less well defined. Interestingly, an allergic component to the pathogenesis of foreign body granuloma has been proposed after several authors observed a direct correlation between a positive skin (wheal-and-flare) test response involving intradermal insertion of silk or catgut sutures and the development of granuloma at the surgical site.³ Given this mechanistic similarity, steroids have been used to treat suture granuloma in the thyroid³ and ophthalmic⁵ literature, albeit with variable success. To our knowledge, this is the first report on the successful use of steroids for foreign body granuloma in the airway after thoracic

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Figure 2. Granulation tissue seen over the distal end of the Y-stent at the left bronchial arm 1 week after placement (A) and 3 months after the commencement of steroid treatment (B).

surgery. Although resection remains the cornerstone of management and infection should always be excluded in the first instance, we suggest that systemic steroids be considered as an adjunct in intractable cases of foreign body granuloma.

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Teratoma with malignant transformation in the anterior mediastinum

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Malignant transformation of teratoma in the mediastinum is rare. Pathologically, malignant teratoma can be divided into three types: immature teratoma, teratoma with other malignant germ cell tumor components (such as yolk sac tumor, embryonal carcinoma, choriocarcinoma, and seminoma), and teratoma with malignant

transformation (TMT).^{1,2} TMT is a non-germ cell malignant tumor arising from a preexisting mature teratoma. To our knowledge of the literature, TMT in the mediastinum is extremely rare.^{3,4} This report describes a surgical case of adenocarcinoma arising from a mature, cystic teratoma in the anterior mediastinum.

Clinical Summary

A 43-year-old woman was admitted to the hospital with a mediastinal mass. Eight years previously, she had undergone a medical workup for this mediastinal mass but had refused to heed the recommendation of surgery. At this later admission, she reported a 3-month history of exertional breathlessness. Chest radiography showed a large mass shadow from the mediastinum to the left thoracic cavity; the mass had clearly enlarged relative to its appearance 8 years previously. Contrast-enhanced computed tomography showed a lobulated, cystic mass with a fat component that measured 12 × 9 × 14 cm in the anterior mediastinum to the left thoracic cavity (Figure 1). The laboratory values were within reference limits. Human chorionic gonadotropin, α -fetoprotein, and

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