

View from Within: Radiology in Focus

Radiological diagnosis of rhinoscleroma—the ‘Palatal Sign’

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Abstract

This paper reports a characteristic radiological finding observed in seven cases of rhinoscleroma with nasal involvement. The soft palate exhibits a marked thickening at its attachment to the hard palate which tapers off towards its free edge. This new sign could be of help in the early diagnosis of this condition.

Introduction

Rhinoscleroma, a chronic granulomatous condition of the nose and upper aerodigestive tract, does not pose much of a diagnostic challenge in countries where the condition is endemic. This does not seem to be the case in countries where only sporadic cases are reported. Some patients have gone undiagnosed for up to 41 years (Stiernberg and Clark, 1983). Murphy (1982) points out that with modern air travel facilities, constant awareness of the condition ensures early diagnosis and proper management.

The definitive diagnosis of rhinoscleroma remains microbiological by the culture of the causative organism (*Klebsiella rhinoscleromatis*) from swabs and biopsy materials, and histological by the demonstration of the typical Russell bodies and Mikulicz cells with gram-negative bacilli in their cytoplasm. Radiological findings are reported as non-specific,

though useful in defining the extent of the disease and response to treatment (Becker *et al.*, 1981). This paper reports a characteristic radiological sign observed in all seven scleroma patients with nasal involvement.

Materials and methods

Eight cases of rhinoscleroma were managed at the King Fahd Hospital of the University, Al Khobar, Saudi Arabia between 1986 and 1990. Seven patients had nasal involvement and in the remaining patient the nose was free of disease. Table I gives the presenting symptoms and shows the sites of the lesions. Retrospective study of the radiological films of the first six patients revealed a characteristic finding in the soft palate of the five patients with nasal involvement irrespective of the stage of the disease. On the lateral view of the postnasal space, the soft palate exhibited marked thickening at its attachment to the hard palate which tapered off towards its free edge. This sign was then used as a diagnostic marker in the last two

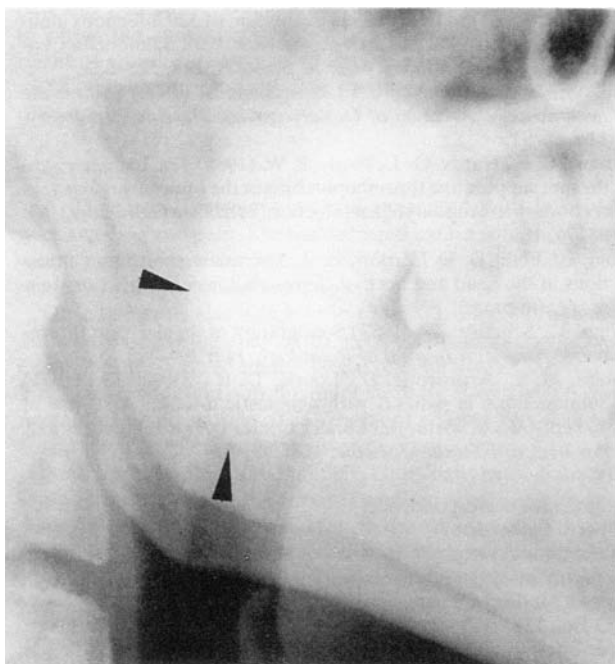


FIG. 1

Lateral soft tissue radiograph showing an oedematous V-shaped soft palate.

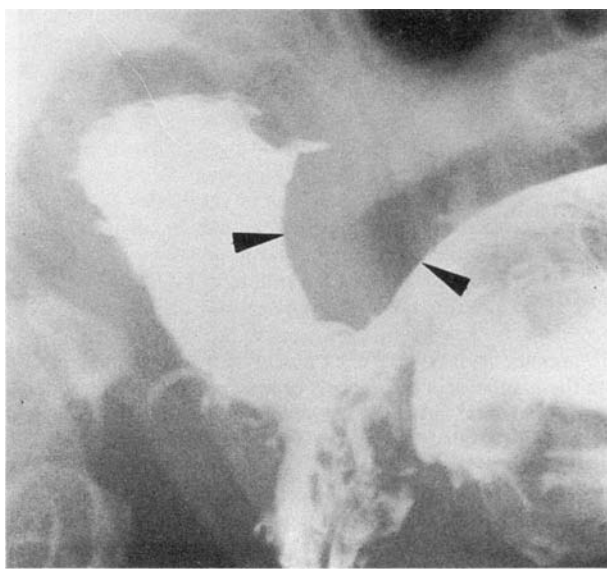


FIG. 2

Dye study showed a fixed shortened palate exhibiting the V-shaped deformity.

TABLE I
THE DETAILS OF THE EIGHT RHINOSCLEROMA PATIENTS

No.	Age & Sex	Presenting symptoms	Sites involved with disease
1	M.24	Nasal obstruction, hoarseness, stridor	Nose, larynx and trachea
2	M.21	Nasal obst, trismus hoarseness dysphagia weight loss, shortness of breath	Nose, nasopharynx, alveolus palate, oropharynx, larynx and hypopharynx
3	F.44	Severe epistaxis	Large septal perforation
4	F.30	Nasal obst made worse by previous surgeries	Extensive nasal adhesions, absent uvula, scarred palate
5	M.27	Recurrent haematemesis	Large septal perforation
6	M.31	Oropharyngeal ulceration, sore throat	Tongue, tonsils, palate, posterior pharyngeal wall, epiglottis.
7	F.21	Nasal obstruction, anosmia	Nasal adhesions
8	F.32	Nasal obst worse after previous surgery	Nasal adhesions

patients and the diagnosis was confirmed microbiologically and histologically.

The characteristic V-shaped deformity which was first noticed in the first patient in this series (Fig. 1) was presumed to be palatal oedema caused by back pressure of the huge nasal mass in the patient's nasal cavity. It was the appearance of the same sign in dye studies of the second patient that prompted the search for the sign in subsequent patients. Figure 2 shows the fixed grossly deformed and shortened palate of patient no. 2 outlined by leaking dye exhibiting the characteristic V-shaped deformity of the palate in spite of the advanced stage of the disease. Figure 3 shows the oropharynx of the patient following release of trismus and partial palatotomy.

Patient no. 6, who was the only patient without nasal involvement, posed the greatest diagnostic challenge. This 31-year-old male was referred with sinister looking ulcerative lesions in the oral mucosa, tongue, fauces, soft palate and posterior pharyngeal wall. The epiglottis was irregularly eroded and half of its free edge had disappeared. The right tonsil had nearly disappeared and the left tonsil showed extensive ulceration (Fig. 4). His condition had started five years earlier with a nodule on the tongue which broke down into a painful ulcer that spread to all the sites mentioned above. Two biopsies were reported as non-specific granuloma. He was free of nasal symptoms throughout this period, and clinically the nose and post-nasal space were healthy. Lateral X-ray of the postnasal space did not show the characteristic thickening of the palate (Fig. 5) in spite of the extensive lesions in the fauces and the oral sur-



FIG. 3

Photograph showing palatal defect created surgically and faucial pillars adherent to the posterior pharyngeal wall of patient no. 2.

face of the palate. At surgery all involved sites were biopsied and rhinoscleroma was mentioned in the differential diagnosis which included tuberculosis, Behçet's disease, and neoplasia.

The seventh patient presented with nasal obstruction and anosmia since childhood. Clinical examination showed bilateral nasal adhesions and crusting. Radiography of the post-nasal space (Fig. 6) showed the characteristic V-shaped thickening of the palate. *Klebsiella rhinoscleromatis* was grown from nasal swabs and biopsy material and histology was positive for rhinoscleroma.

Discussion and conclusions

For the reported sign to be acceptable as a fairly accurate diagnostic indicator of rhinoscleroma it has to satisfy the two basic criteria that minimize false positive and false negative results. It has to be fairly specific to the disease to minimize false positive results, and it has to be reproducible in a high percentage of cases to minimize false negative results. To address the first criterion, radiographs of a variety of common and rare conditions affecting the nose, nasopharynx and palate (Table II) were reviewed. The characteristic V-shaped deformity of the palate observed in lateral radiographs of the postnasal space in cases of rhinoscleroma with nasal involvement was not observed in any of the conditions studied.

To address the second criterion, a search in the English Literature was made for evidence of the palatal sign in radiographic studies of rhinoscleroma. In a comprehensive radiographic study of 342 cases of scleroma in which the nose was affected in 329 cases (Shehata *et al.*, 1975) the palatal sign appears clearly in the only two figures showing lateral views of the postnasal space. In the report by Taha *et al.* (1981), the characteristic

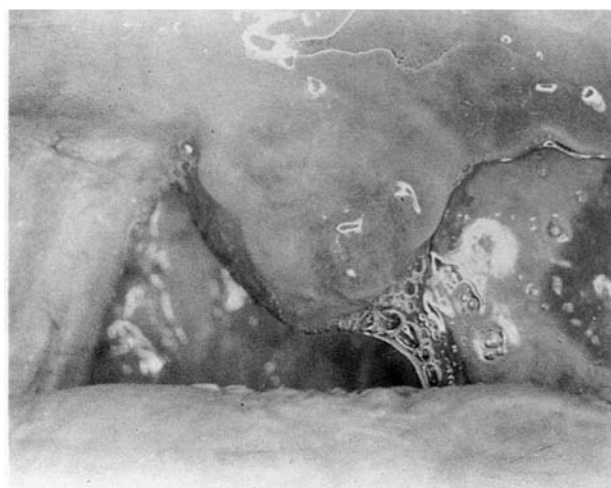


FIG. 4

Photograph of patient no. 6 showing an empty right tonsillar fossa, oedematous curled uvula and ulcerated left tonsil.

TABLE II

NASAL, NASOPHARYNGEAL AND PALATAL CONDITIONS STUDIED FOR COMPARISON

Nasal conditions

1. Atrophic rhinitis
2. Chronic sinusitis
3. Nasal polyposis
4. Antrochoanal polyp
5. Rhinosporidiosis

Nasopharyngeal conditions

6. Rhinosporidiosis
7. Nasopharyngeal carcinoma

Palatal conditions

8. Cleft palate
9. Repaired cleft palate
10. Minor salivary gland tumour extending into soft palate
11. Obstructive sleep apnoea

palatal deformity is clearly identifiable in the only figure showing a lateral view of the postnasal space. In the report by Dawlatly *et al.* (1988), the palatal sign is also seen in the only lateral projection of the postnasal space, it also forms part of the population of this study. It is noteworthy that all but one of the published radiographs were highlighting other features of rhinoscleroma and the palatal sign was just a chance finding. Shehata *et al.* (1975) point out that the soft palate is the most frequently involved site and describe it as short thick and markedly deformed. They do not highlight the V-shaped deformity reported here.

It is proposed that this 'organized deformity' of the soft palate seen in cases of rhinoscleroma with nasal involvement is the result of two determining factors. The granulomatous infiltration on the upper surface of the soft palate resulting in thickening of the palate which is moulded into the characteristic V-shaped deformity by the massaging action of the tongue and food boluses during deglutition. Diagnosing a patient in the

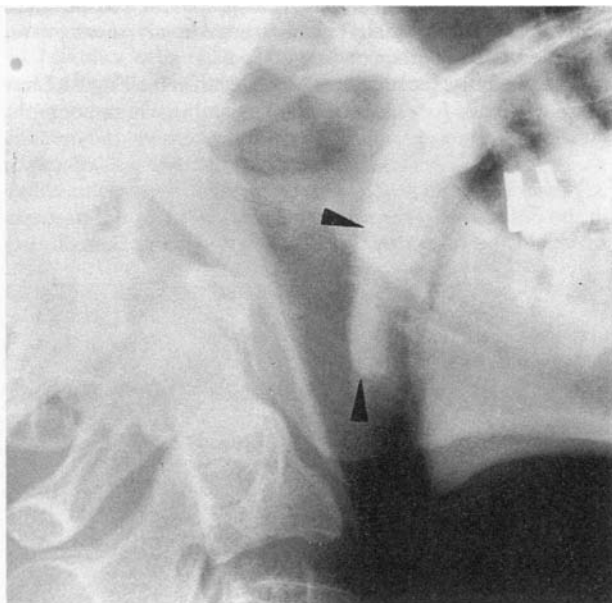


FIG. 5

Radiograph of patient no. 6 showing a normal palate.

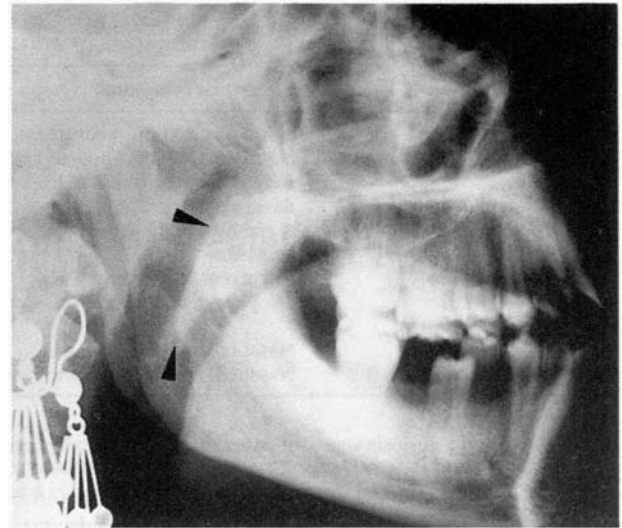


FIG. 6

Radiograph of patient no. 7 showing the V-shaped deformity prior to confirming the diagnosis by culture and histology.

early exudative phase of the disease would make it possible to document the natural progression of the palatal deformity by serial radiographs. To achieve this, nasal swabs and scrapings are now sent for culture for *K. rhinoscleromatis* in all patient-prior to cauterly and/or submucous diathermy. And all 'polyps' and biopsy material removed are sent for histology as well as microbiology.

Conclusion

It is hoped that the detection of the characteristic V-shaped deformity of the soft palate in non-endemic areas would alert the clinician to the possibility of rhinoscleroma and enable an early diagnosis and proper management.

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