

## LETTERS TO THE EDITOR

### Cephalometric measurements in snorers, non-snorers, and patients with sleep apnoea

The paper from Dr F Maltais and colleagues (June 1991;46:419-23) raises several questions.

Firstly, the authors report changes in posterior airway space (PAS), soft palate length (PNS-P), and mandibular plane to hyoid distance (MP-H) that are similar to those widely reported elsewhere. As they found that PNS-P and MP-H did not correlate with body mass index they have inferred that obesity is not an important cause of the cephalometric abnormalities observed. General body obesity is, however, likely to mediate its aetiological influence on obstructive sleep apnoea through deposition of fat somewhere in the neck,<sup>1,2</sup> and (as the authors recognise) fat deposition in the neck has only a limited correlation with general obesity. Consequently, to establish that cephalometric abnormalities are independent of obesity as aetiological factors for obstructive sleep apnoea it is essential to consider some measure of neck fat deposition. We too have found that body mass index is not correlated with PNS-P or MP-H; neck circumference, however, is, and after correction for this confounding variable neither PNS-P nor MP-H remains a significant predictor of the severity of obstructive sleep apnoea.<sup>1</sup>

Secondly, the authors suggest that MP-H is an "important determinant" of obstructive sleep apnoea without considering that hyoid descent occurs as a normal physiological response to pharyngeal crowding.<sup>3</sup> Thus the increase in MP-H in obstructive sleep apnoea and snoring patients may be a normal response to reduced pharyngeal size secondary to local fat deposition without MP-H itself being of any independent aetiological importance.

Finally, this paper has not corrected for a methodological problem that affects the cephalometric measurement of pharyngeal dimensions. We have shown that during standard cephalometry head extension may vary by up to 27°, a movement that alters PAS and MP-H and is capable of generating the changes reported by the authors.<sup>1</sup> Such variation is possible because cephalometry fixes the skull but does not stop movement of the body under the fixed head. It is of practical importance because patients being investigated for sleep and breathing disorders spontaneously show a variation in head extension of 40°, a variation that correlates with both neck circumference and the severity of obstructive sleep apnoea.<sup>1</sup>

Our studies have used a radiological technique that differs from that of the authors but produces results very similar to those reported here and by others. To finally resolve these issues, the authors may wish to examine the interrelationships between neck fat deposition and cephalometric indices assessed by their own method (with appropriate measures to control body position during imaging). In the absence of

such data the results of this and previous studies should be interpreted with considerable caution.

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- 1 Davies RJO, Stradling JR. The relationship between neck circumference, radiographic pharyngeal anatomy, and the obstructive sleep apnea syndrome. *Eur Respir J* 1990;3: 509-14.
- 2 Katz I, Stradling J, Slutsky AS, Zamel N, Hoffstein V. Do patients with obstructive sleep apnea have a short and fat neck? *Am Rev Respir Dis* 1990;141:1228-31.
- 3 Wickwire NA, White RP, Proffit WR. The effect of mandibular osteotomy on tongue position. *J Oral Surg* 1972;30:184-90.

**AUTHOR'S REPLY** We appreciate the opportunity to respond to Drs Davies and Stradling. Although there is evidence that neck circumference may be a predictor of sleep apnoea, we believe that one must be careful not to overemphasise the role of fat deposition in the development of cephalometric abnormalities in these patients. Horner *et al* reported that fat deposits are observed at the level of the soft palate and not in the glossopharynx,<sup>1</sup> and that similar fatty streaks are observed in obese individuals both with and without sleep apnoea. Therefore other mechanisms must contribute to these abnormalities and the role of oronasal breathing has to be considered. Experimental studies have shown that long term nasal obstruction leads to cranio-mandibular abnormalities by modifying the electromyographic activity of the upper airway dilator muscles and mandibular growth.<sup>2</sup> Recent data from our laboratory suggest that nasal surgery is effective only in those patients obstructive sleep apnoea patients whose cephalometric radiographs are normal,<sup>3</sup> illustrating the role of the impediment in nasal breathing in the development of structural abnormalities of the maxillofacial architecture.

Concerning the influence of head position, we found no difference in the mean angle between the hard palate and the line subtending the anterior border of the spinal canal between the different groups (control 1: 98.6° (SE 2.2°); control 2: 97.5° (3.0°); snorers: 103.7 (2.2°); patients with obstructive sleep apnoea: 103.0° (1.3°). Body movements seem therefore to be extremely limited during standard radiography and cannot account for the difference in cephalometric measurements that we found.

#### F SERIES

- 1 Horner RL, Mohiaddin RH, Lowell DG, Shea SA, Burman ED, Longmore DB, *et al*. Sites and sizes of fat deposits around the pharynx in obese patients with obstructive sleep apnoea and weight matched controls. *Eur Respir J* 1989;2:623-2.
- 2 Sériès F, St Pierre S, Carrier G. Cephalometric measurements may predict the response to nasal surgery in sleep apnea [abstract]. *Eur Respir J* 1990;3:P747.
- 3 Tomer BS, Harvold EP. Primate experiments on mandibular growth direction. *Am J Orthod* 1982;82:115-9.

#### Intramural oesophageal dissection

I read with interest the review article by Miss JM Hanson and others (July 1991;46:524-7). I believe that intramural oesophageal dissec-

tion may be commoner than has been generally thought because not all cases are diagnosed or referred to hospital. Furthermore, there is a variety of these intramural oesophageal dissections, of which the case of Miss Hanson and her colleagues represents only one. In the last 22 years I have observed five patients with oesophageal dissection, four of whom had a typical double barrelled oesophagus demonstrated at barium swallow and one of whom had a submucosal haematoma.

Finally, I hope that the authors will not mind my querying their statement that 40 cases had been reported. I suspect that many more cases have been reported in European publications, including one of my own published in 1977.<sup>1</sup>

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- 1 Moghissi K, Joyeux A. Ruptures spontanées intramurales de l'oesophage. *J Chir (Paris)* 1977;113:263-7.

## NOTICE

### Scadding-Morrison Davies joint fellowship in respiratory medicine 1992

The Scadding-Morrison Joint fellowship is available to support visits to medical centres in the United Kingdom or abroad, for the purpose of undertaking studies related to respiratory medicine. Medical graduates practising in the United Kingdom, including consultants and irrespective of the number of years in that grade, may apply. Applicants should submit a curriculum vitae with a detailed account of the duration and nature of the work and the centres to be visited, confirming that these have agreed to provide the facilities required, and stating the sum of money needed for travel and subsistence. Up to £12 000 may be awarded to a successful applicant, or the sum may be divided to support two or more applicants. Applications should be sent by 31 January 1992 to Dr I A Campbell, secretary to the Scadding-Morrison Davies fellowship, Llandough Hospital, Penarth, Cardiff CF6 1XX.