

Cephalometric assessment of the posterior airway space using a new tongue positioning system in OSAS patients

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Purpose: Lateral cephalometric radiographs and the following cephalometric analysis are very important in diagnosis of the posterior airway space (PAS) in OSAS patients. Nevertheless, the position of the tongue and tilt of the head is not defined so that the measurement of the airway space is not correct. For this reason a special fixation system should be built so that the tongue could be localized and positioned during x-ray.

Material and methods: The new positioning system of the tongue contains a hole like a bell for taking in the tongue. This hole is connected with a wreath bar and fixation elements. The teeth of the mandible and maxilla bite in the wreath. It is possible to move the mandible in each requested position and to measure the position at a scale on the bar. The bar is fixed at the x-ray apparatus so that the head is fixed in the vertical direction. Patients with OSAS are examined by lateral cephalometric radiographs using the new system. Then, the cephalometric analysis is carried out.

Results: The exact localization and positioning of the tongue in lateral cephalometric radiographs could be guaranteed by using this special positioning bar, bell and fixation components. The scale of the bar offers the opportunity to make the x-ray in a defined situation like protrusion of the mandible. Therefore, a simulation of the effect of protrusion apparatus for therapy of OSAS can be simulated. For taking the x-ray with this system it is necessary to open the mouth. This leads to reduction in the PAS: the distance in the mandibula plane was reduced of 31 %, in the uvula tip plane of 22 % and the hyoid menton distance of 5 %.

Conclusions: The new fixation and positioning system makes possible a reproducible localization and positioning of the tongue, so that the PAS can exact be measured. This method seems to become a new standard method in diagnosis of OSAS by lateral cephalometric radiographs. The normal values using this method for measurement the PAS have to be new defined.