DIAGNOSTIC EFFICACY OF THREE-DIMENSIONAL CEPHALOMETRICS: A COMPREHENSIVE REVIEW

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Introduction

Three-dimensional (3D) computed tomography (CT) based cephalometric analyses were introduced as a new method for diagnosis and virtual planning in orthodontics. Nevertheless, their accuracy and reproducibility still remains questionable.

Aim

Aim of this review was to evaluate the contemporary diagnostic efficacy of 3D cephalometry based on current evidence.

Materials and methods

Electronic database searches of published and unpublished literature were performed. The reference lists of all eligible articles were examined for additional studies. The level of evidence of the included articles on their three-dimensional cephalometric analysis methodology was performed by means of the QUADAS 2 tool (Quality Assessment of Diagnostic Accuracy of Studies tool 2).

Results

Fifty-seven studies met the criteria for eligibility. None of them showed high level of evidence, 9 presented moderate and 48 low evidence. Spiral computerized tomography (spiral-CT) showed high level of precision between imaging and physical measurements on cadaver heads, while cone beam computerized tomography (CBCT) also showed high level of precision on dry skulls, presenting significant lower level of patient exposure to radiation. In addition, 3D-CBCT imaging permits accurate tooth size measurements and independent assessment of left and right side of the skull. These findings are in accordance with previously conducted studies.

Conclusions

According to the current evidence, it cannot be concluded that 3D cephalometrics should be performed on all orthodontic patients. More specific methods with standardized software, based on qualitative controlled trials are needed until 3D cephalometrics could be regarded as a routine orthodontic diagnostic procedure.

The authors declare that they have no competing interest.