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### **Comparative Study between the Hand-Wrist Method and Cervical Vertebral Maturation Method for Evaluation Skeletal Maturity in Cleft Patients**

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#### Abstract

**Objective:** To test the measure of agreement between use of the Skeletal Maturation Index (SMI) method of Fishman using hand-wrist radiographs and the Cervical Vertebral Maturation Index (CVMI) method for assessing skeletal maturity of the cleft patients.

**Material and Method:** Hand-wrist and lateral cephalometric radiographs of 60 cleft subjects (35 females and 25 males, age range: 7-16 years) were used. Skeletal age was assessed using an adjustment to the SMI method of Fishman to compare with the CVMI method of Hassel and Farman. Agreement between skeletal age assessed by both methods and the intra- and interexaminer reliability of both methods were tested by weighted kappa analysis.

**Results:** There was good agreement between the two methods with a kappa value of 0.80 (95% CI = 0.66-0.88, p-value <0.001). Reliability of intra- and inter-examiner of both methods was very good with kappa value ranging from 0.91 to 0.99.

**Conclusion:** The CVMI method can be used as an alternative to the SMI method in skeletal age assessment in cleft patients with the benefit of no need of an additional radiograph and avoiding extra-radiation exposure. Comparing the two methods, the present study found better agreement from peak of adolescence onwards.

**Keywords:** Hand-wrist method, Cervical vertebral maturation (CVMI), Skeletal maturity, Cleft patients

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