



## **Microradiographic and histological evaluation of the bone-screw and bone-plate interface of orthodontic miniplates in patients**

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**Objectives:** *To describe the tissue reactions at the bone-titanium interface of orthodontic miniplates in humans.*

**Materials and methods:** *42 samples, consisting of tissue fragments attached or not to miniplates or their fixation screws, were collected from 24 orthodontic patients treated with miniplate anchorage, at the time of removal of their miniplates. The samples were embedded in methylmethacrylate and cut into undecalcified sections which were submitted to microradiographic analysis. The sections were also stained and examined under ordinary light.*

**Results:** *Three types of reactions were observed both on the histological sections and on the microradiographs. 1/ The majority of the stable miniplates were easy to remove (34/42). The tissue samples collected consisted mainly in mature lamellar bone with some medullary spaces containing blood vessels. 2/ Two screws were highly osseointegrated and required the surgeon to remove them by trephining (2/42). They were surrounded by bone tissue which extended to the miniplate. The histological features were similar to the previous group, though the bone-screw contact was higher. 3/ In 6 samples obtained after unstable miniplate removal during the treatment, we observed either some woven bone trabeculae or loose connective tissue, without any histological sign of inflammation.*

**Limitations and Conclusion:** *For evident ethical reasons, our data were limited by the size of the tissue fragments and the limited number of patients and variety of clinical presentations. The healing reactions consisted mainly in mature lamellar bone tissue sparsely in contact with the screw or the miniplate, with signs of a moderate remodelling activity.*