

CHAPTER VI

CONCLUSIONS

EARR is a part of the hyalinized zone elimination process induced by heavy orthodontic force application. Many studies have reported incidence of and risk factors for EARR. However, few studies have reported on Asian populations, especially such populations in Thailand. The objectives of this study were to evaluate the incidence and degree of EARR in maxillary incisors after orthodontic treatment and to evaluate some associated factors related to EARR in maxillary incisors.

The examination charts and treatment records of 181 patients were investigated. There were 62 male and 119 female patients in this study. The age at start of treatment ranged from 10 to 46 years. The mean age was 16.23 ± 4.75 years. From these 181 cases, 564 maxillary teeth were selected. The mean EARR was 1.55 ± 1.30 mm. This value is equal to a $9.32 \pm 7.78\%$ reduction of initial root length. There were 299 maxillary central incisors and 265 maxillary lateral incisors. The mean EARR of maxillary central and lateral incisors were 1.39 ± 1.27 mm ($8.24 \pm 7.22\%$) 1.69 ± 1.14 mm ($10.16 \pm 6.78\%$), respectively. A Paired sample-*t*-test showed that the mean EARR in maxillary lateral incisors was statistically significantly higher than in maxillary central incisors at $P < .05$.

A mild degree of EARR ($\leq 10\%$) was expressed in 59.6% of the investigated teeth, 31.9% had moderate EARR (10-20%), and 8.5% had severe EARR.

Of 12 factors examined in this study, dilacerated or pointed root shape, extraction of upper premolar teeth and greater treatment duration were statistically associated with EARR at $P < .001$. Incidence of allergic condition was statistically associated with EARR at $P < 0.01$. Adult status, large overjet (>6 mm) and history of incisor trauma were statistically associated with EARR at $P < .05$. Sex of subjects, overbite, tongue-thrusting habit, types of malocclusion and types of bracket were not associated with EARR.

However, this study was a preliminary investigation of factors associated with EARR. It is suggested that further studies should control any associated factors or should include a greater number of investigated cases.