

## INTISARI

Teknik paralel dan bisektris merupakan jenis teknik yang digunakan pada radiografi periapikal. Angulasi vertikal dan horisontal serta penempatan film yang kurang tepat pada teknik bisektris menyebabkan citra radiograf mengalami pemendekan, pemanjangan, serta tumpang tindih antara gigi yang bersebelahan. Penggunaan radiograf periapikal teknik paralel dapat meminimalisir distorsi radiograf. Berdasarkan proses pencitraannya, terdapat 2 metode untuk menghasilkan radiograf yaitu metode analog dan digital *indirect*. Tujuan penelitian ini yaitu untuk membandingkan distorsi vertikal dan horisontal yang terjadi pada radiograf periapikal teknik paralel antara metode analog dan digital *indirect*.

Penelitian ini merupakan penelitian observasional dengan teknik *cross sectional*. Sampel penelitian berupa 36 gigi insisivus sentral dan lateral rahang atas yang telah dilakukan pencabutan dan ditanam dalam balok malam merah. Sampel dicitrakan dengan teknik paralel sebanyak 2 kali yaitu dengan metode analog dan digital *indirect*. Jarak vertikal dan horisontal diukur pada gigi sesungguhnya, radiograf periapikal analog dan digital *indirect*. Data hasil pengukuran vertikal dan horisontal dianalisis dengan uji non-parametrik *Kruskal-Wallis* dengan *Post hoc* uji *Mann-Whitney*. Perbedaan rasio distorsi vertikal dan horisontal radiograf periapikal antara metode analog dan digital *indirect* dianalisis menggunakan *Independent T- test*.

Hasil penelitian menunjukkan terdapat distorsi citra radiograf periapikal teknik paralel terhadap objek gigi sesungguhnya, baik pada metode analog maupun digital *indirect* ( $p > 0,05$ ). Tidak terdapat perbedaan signifikan ( $p > 0,05$ ) rasio distorsi vertikal antara citra radiograf periapikal metode analog dan digital *indirect*, namun terdapat perbedaan yang signifikan ( $p < 0,05$ ) pada rasio distorsi horisontal kedua metode tersebut.

Kata kunci: Radiografi periapikal, teknik paralel, radiografi analog, radiografi digital *indirect*, distorsi radiograf

## ABSTRACT

There are two techniques in intraoral periapical radiography, known as paralleling and bisecting technique. Image distortion in radiograph, i.e foreshortening, elongation, and teeth superimposed, is caused by incorrect vertical and horizontal angulation and also caused by incorrect film placement. Image distortion can be minimized by using paralleling technique. Based on image processing, there are two radiograph imaging methods i.e analog and indirect digital. The aim of this study is to compare horizontal and vertical distortion between analogue and indirect digital method of paralleling technique in periapical radiography.

This observational study used cross sectional technique. Samples of this study were 36 permanent maxillary central and lateral incisor teeth. Those samples were placed in paraffin box and then exposed by using analogue and indirect digital paralleling technique. Vertical and horizontal distance were measured at teeth and both of analogue and indirect digital radiographs. The vertical and horizontal measurement were analyzed by using Kruskal-Wallis test followed with Mann-Whitney Post-hoc test. Then vertical and horizontal distortion ratio between analogue and indirect digital method are compared by using Independent T-test.

Results of this study reveal that there are distortion between periapical radiograph with the actual measurement in teeth, both in analogue and indirect digital method. Meanwhile, no significant ( $p > 0,05$ ) difference in vertical distortion between analogue and indirect digital method, but there is significant ( $p < 0,05$ ) difference in horizontal distortion observed in those methods.

**Keywords:** Periapical radiography, paralleling technique, analog radiography, indirect digital radiography, image distortion