

INTISARI

Perawatan kasus fraktur maksilofasial meliputi reduksi, fiksasi, dan immobilisasi. Immobilisasi dicapai melalui *Interdental Wiring* (IDW) dan dipertahankan 2-8 minggu. IDW yang sering digunakan adalah dengan *arch bar* yang diikat dengan kawat *stainless steel* (SS) dan dipuntir pada kedua ujung kawat. Pemuntiran kawat SS mengakibatkan kerusakan berupa perubahan topografi seperti alur, lubang, dan goresan yang kemungkinan memfasilitasi perlekatan bakteri. Bakteri *Streptococcus mutans* dan *Staphylococcus aureus* merupakan bakteri pathogen gram positif rongga mulut yang sering terlibat karies gigi, gingivitis hingga infeksi. Tujuan penelitian ini adalah mengevaluasi potensi perlekatan bakteri *Streptococcus mutans* dan *Staphylococcus aureus* pada permukaan kawat SS yang dipuntir dalam pemasangan *arch bar* dengan panjang puntiran kawat yang berbeda.

Tiga kelompok kawat SS yang terdiri dari kawat lurus panjang 10 mm (L10), puntir 5 mm (P5), dan puntir 10 mm (P10) dengan masing-masing 16 sampel. Kawat puntir dibuat sebagai simulasi pemasangan IDW *arch bar* lalu di potong. Sampel direndam saliva dari probandus dengan kriteria inklusi. Kawat dimasukkan *microplate* berisi suspensi bakteri *Streptococcus mutans* dan *Staphylococcus aureus* serta media BHI lalu diinkubasi, kemudian dilakukan dilusi lalu ditumbuhkan pada media dan diinkubasi. Jumlah banyaknya perlekatan bakteri dihitung menggunakan *Colony counter*. Kerusakan kawat, pola dan letak perlekatan bakteri pada kawat diamati dengan *Scanning electron microscopy* (SEM).

Hasil pengamatan SEM menunjukkan variasi kekasaran antar kelompok kawat dan perlekatan *Streptococcus mutans* yang meningkat pada sela-sela puntiran sedangkan perlekatan *Staphylococcus aureus* meningkat pada topografi alur akibat pemuntiran. Hasil uji *Kruskall- Wallis* dan post hoc *Mann- Whitney* menunjukkan perbedaan signifikan jumlah perlekatan bakteri *Streptococcus mutans* dan *Staphylococcus aureus* antar kelompok sampel penelitian ($p=0,001$) yang meningkat seiring bertambahnya panjang kawat puntir. Kesimpulan pada penelitian ini bahwa jumlah perlekatan bakteri *Streptococcus mutans* dan *Staphylococcus aureus* pada kawat yang dipuntir lebih banyak dari pada kawat lurus.

Kata kunci: *IDW arch bar*, *Streptococcus mutans*, *Staphylococcus aureus*, *Stainless steel*

ABSTRACT

*Treatment of maxillofacial fracture cases includes reduction, fixation and immobilization. Immobilization is achieved via Interdental Wiring (IDW) and maintained 2-8 weeks. IDW that often used is an arch bar tied with stainless steel (SS) wire and twisted at both ends of wire. Twisting SS wire results damage in the form of topographic changes such as grooves, holes, and scratches which possibly facilitate the attachment of bacteria. *Streptococcus mutans* and *Staphylococcus aureus* bacteria are gram-positive pathogenic bacteria in the oral cavity which are often involved in dental caries, gingivitis and infection. The aim of this research is to evaluate the potential for attachment of *Streptococcus mutans* and *Staphylococcus aureus* bacteria to the surface of twisted SS wires in the arch bars application with different length of twisted wire.*

*Three groups of SS wire consisting of 10 mm straight wire (L10), 5 mm twisted wire (P5), and 10 mm twisted wire (P10) with 16 samples each. The twisted wire is made by simulate application an IDW arch bar and then cut the twisted wire. Samples were soaked in saliva from the probandus according to inclusion criteria. The wire was inserted into a microplate containing a suspension of *Streptococcus mutans* and *Staphylococcus aureus* bacteria and BHI media then incubated, then dilution was carried out then grown on the media and incubated. The number of bacterial attachments was counted using a Colony counter. Wire damage, pattern and location of bacterial attachment to the wire were observed using scanning electron microscopy (SEM).*

*SEM observation results showed variations in roughness between groups of wires and the attachment of *Streptococcus mutans* which increased between twist, while *Staphylococcus aureus* attachment are increased in the groove topography due to twisting. Kruskal-Wallis test and post hoc Mann-Whitney tests showed significant differences in the number of of *Streptococcus mutans* and *Staphylococcus aureus* bacteria attachments between research sample groups ($p=0.001$) which increased as the length of the twist wire increased. The conclusion of this study is that the number of bacteria *Streptococcus mutans* and *Staphylococcus aureus* attached on the twisted wire is greater than on the straight wire.*

*Key words: IDW arch bar, *Streptococcus mutans*, *Staphylococcus aureus*, Stainless steel*