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Biodegradable vs titanium fixation in maxillofacial fractures: A systematic review

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The objective of this study was to investigate the clinical effectiveness of titanium (T) plate fixation vs biodegradable (B) plate fixation in patients with maxillofacial fractures. We performed a literature search using Cochrane library, PubMed and Embase, and included all randomised controlled trials comparing titanium vs biodegradable plate fixation in patients with maxillofacial fractures and/or dentofacial deformities from 2000 to present. This search yielded 7 studies (n=1089) which fit the inclusion criteria. These studies evaluated various parameters including bone healing (achieving union), plate/screw removal rate, development of infection and handling properties. Three studies reported no significant difference between the rate of union between titanium and bioresorbable plate fixation ($p>0.05$), and one paper reported bone healing was slower after bioresorbable fixation compared to titanium ($p<0.001$). 3 papers report the plate removal rate due to complications such as inflammation was significantly higher after bioresorbable plate fixation at 1 (T-8.94%, B-25.4%, $p<0.001$), 2 (T-11.9%, B-24.1%, $p=0.002$) and 5 (T-16.4%, B-26.4%, $p=0.036$) years respectively. One paper reported an increased rate of infection and screw breakage with bioresorbable vs. titanium plates ($p<0.05$).The interpretation of these results is that titanium and bioresorbable plate fixation produce a non-significantly different rate of bone union, however bioresorbable fixation is associated with a higher rate of complications resulting in plate removal, including infection, inflammation and screw breakage.

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