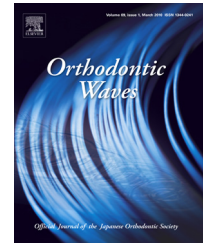


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## Review

## Orthodontic skeletal anchorage: Up-to-date review

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## ABSTRACT

**Purpose:** This review investigated the recent trend regarding skeletal anchorage in major six journals of orthodontics since 2010.

**Materials and methods:** The MEDLINE were searched for finding related articles published in American journals of orthodontics and Dentofacial orthopedics (AJO-DO), The Angle Orthodontists (AO), Korean Journal of orthodontics (KJO), European Journal of orthodontics (EJO), Australian Orthodontic Journal (AOJ) and Journal of clinical orthodontics (JCO) regarding orthodontics skeletal anchorage. Keywords used for searching are microimplants, mini-implant, miniscrews, miniplate, temporary anchorage devices, and skeletal anchorages orthodontics. Based on the information from the titles and abstracts from 2010 to 2016, relevant articles on orthodontic skeletal anchorage were selected and analyzed.

**Results:** Overall, 8.7% articles of major orthodontic journals were regarding orthodontic skeletal anchorage during the time period, called as skeletal anchorage articles (SAA). The 87.8% of SAA used miniscrew implants including microimplants, mini-implants and miniscrews as research materials. The rest 12.2% was about others such as miniplates and new type expanders. AJO-DO published the highest percentage of SAA (33.4%). Percentage of original researches among SAA varies according to Journal: 100% of EJO, 87.8% of AO, 72.1% of KJO, 63.5% of AJO-DO and 33.3% of AOJ. The rest of SAA are mainly case reports. Clinical studies among original researches have ranged from 46% to 85% depending on journals. The overall success rate of skeletal anchorage was ranged from 79% to 98.2%.

**Conclusions:** Steady stream of publication with skeletal anchorage comes 6-10% in the major orthodontic journals.

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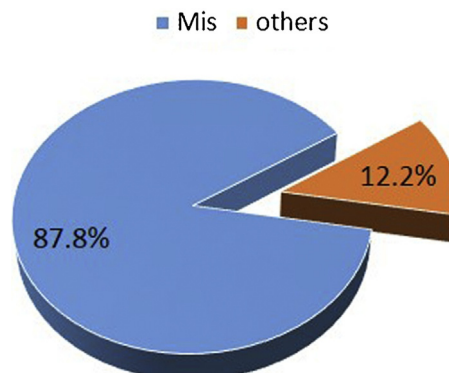
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**1. Introduction**

Various skeletal anchorage systems were developed for orthodontic treatment in early days of skeletal anchorage systems since the first vitalium screw [1-5]. Thereafter, a series of articles have summarized a great progress in the orthodontic skeletal anchorage and tried to answer the clinical questions for the valuable tools.

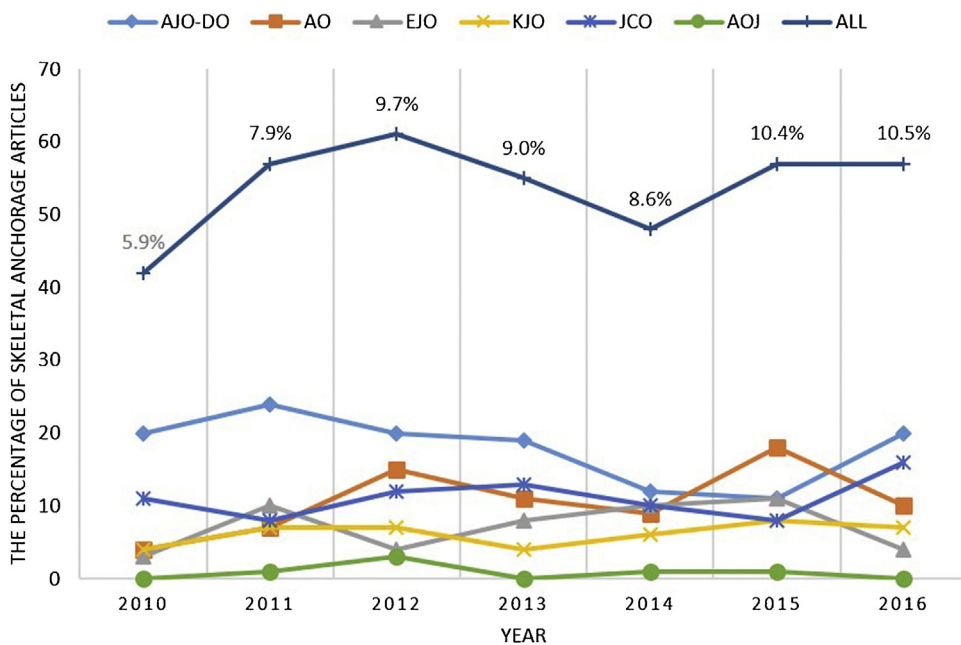
There are six major academic journals leading orthodontics into the cutting-edge of new technology and approaches: American journals of orthodontics and Dentofacial orthopedics (AJO DO), The Angle Orthodontists (AO), Korean Journal of orthodontics (KJO), European Journal of orthodontics (EJO), Australian Orthodontic Journal (AOJ) and Journal of clinical orthodontics (JCO). They are the main sources for clinicians to share new ideas regarding skeletal anchorages, clinical applications, and biological and clinical assessments and also to pursue further progresses in orthodontics. Therefore, it is very meaningful to overview comprehensively their publication trend regarding orthodontic skeletal anchorage (OSA).

Early review articles suggested clinical indications, advantages and drawbacks, risk factors for failure such as oral hygiene and also presented placement methods of miniscrew implants (MIs) including microimplants, mini-implants and miniscrews [6,7]. Regarding MIs length, 8-mm microimplants were recommended due to higher success rate [8]. Further, based on the fear for this strange new approach, the potential



**Fig. 2 – Distribution of skeletal anchorage articles according to main topic materials. MIs: microimplants, mini-implants and miniscrews; others: miniplates, borne-borne expander, and combinational used of functional appliances.**

risks and complications of orthodontic miniscrews were thoroughly reviewed during insertion, under orthodontic loading, and during removal [9]. With prudence, Reynders et al. systematically analyzed MIs success rate, which was greater than 80% [10]. Finally, Crismani et al. asserted that screws less than 8 mm in length and 1.2 mm in diameter should be avoided [11]. Through meta-analysis, the mean difference of anchorage loss between the MIs and conventional



**Fig. 1 – The percentage of recent articles regarding orthodontic skeletal anchorage in 6 major journals; AJO-DO: American journals of orthodontics and Dentofacial orthopedics; AO: The Angle Orthodontists; EJO: European Journal of orthodontics; KJO: Korean Journal of orthodontics; JCO: Journal of clinical orthodontics; and AOJ: Australian Orthodontic Journal.**

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