

Supplementary Materials

Systematic Review

Comparative Evaluation of the Effects of Mini-Screw and Mini-Plate Skeletal Anchorage in the Orthopedic Treatment of Growing Class III Malocclusion: A Systematic Review and Meta-Analysis

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Table S1. Search strategy for each database.

Database	Search Strategy
Pubmed	((("maxillary advancement") OR ("maxillary protraction")) OR ("skeletal class III malocclusion")) AND ("miniscrew-assisted")) OR ("miniscrew-anchored")) OR ("orthodontic miniscrews")) OR ("orthodontic miniplates"))
Web Of Science	((ALL=("maxillary protraction")) OR ALL=("maxillary advancement")) OR ALL=("skeletal class III malocclusion")) AND ALL=("miniscrew-assisted")) OR ALL=("miniscrew-anchored")) OR ALL=("orthodontic miniplates")) OR ALL=("orthodontic miniscrews"))
Cochrane	("maxillary protraction"):ti,ab,kw OR ("skeletal class III malocclusion"):ti,ab,kw AND ("Miniscrew-anchored"):ti,ab,kw OR ("orthodontic miniplates"):ti,ab,kw OR ("orthodontic miniscrews"):ti,ab,kw
Scopus	(TITLE-ABS-KEY ("maxillary advancement") OR TITLE-ABS-KEY ("maxillary protraction") OR TITLE-ABS-KEY ("skeletal class III malocclusion") AND TITLE-ABS-KEY ("miniscrew-assisted") OR TITLE-ABS-KEY ("miniscrew-anchored") OR TITLE-ABS-KEY ("orthodontic

	miniplates") OR TITLE-ABS-KEY ("orthodontic miniscrews"))
Embase	('maxillary advancement')/br OR ('maxillary protraction') OR ('skeletal class III malocclusion') AND ('miniscrew-assisted') OR ('miniscrew-anchored') OR ('orthodontic miniplates') OR ('orthodontic miniscrews')

Table S2. Description of PICO of this systematic review.

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Population (P)	Growing Patients in Prepuberal and Puberal Stage with Class III Malocclusion
Intervention (I)	Maxillary protraction assisted by orthodontic miniplates
Comparison (C)	Maxillary protraction assisted by orthodontic miniscrew
Outcome (O):	Skeletal, dental and soft tissue cephalometric parameters
Study design (s)	Clinical trials, case-control studies, cohort studies, cross-sectional studies, longitudinal studies, prospective studies, and retrospective studies

Table S3. Grading of Recommendation, Assessment, Development, and Evaluation (GRADE) analysis for the studies about treatments with miniplates.

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Study	Design	Risk of Bias	Inconsistency	Indirectness	Imprecision	Publication Bias	GRADE Quality
De Clerck et al. (2010) [9]	Non-RCT	Moderate – based on study design and randomization process	Low – variation across studies	No – applicability to patient population	Low – assessment of sample size and confidence	Unlikely – judged from peer-reviewed status and design	Moderate (●●●○)
Sar et al. (2011) [11]	Non-RCT	Moderate – based on study design and randomization process	Low – variation across studies	No – applicability to patient population	Moderate – assessment of sample size and confidence	Unlikely – judged from peer-reviewed status and design	Moderate (●●●○)
Eid et al. (2016) [22]	Non-RCT	Moderate – based on study design and randomization process	Moderate – variation across studies	No – applicability to patient population	Moderate – assessment of sample size and confidence	Unlikely – judged from peer-reviewed status and design	Moderate (●●●○)
Elnagar et al. (2017) [24]	RCT	Low – based on study design and	Low – variation across studies	No – applicability to patient population	Low – assessment of sample size and	Unlikely – judged from peer-reviewed	High (●●●●)

		randomiza- tion process		confi- dence	status and design	
Bozkaya et al. (2017) [20]	Non-RCT	Moderate – based on study de- sign and randomiza- tion process	Low – vari- ation across studies	No – ap- plicability to patient popula- tion	Moderate – assess- ment of sample size and confi- dence	Unlikely – judged from peer- reviewed status and design (●●●○)
Liang et al. (2021) [10]	RCT	Low – based on study de- sign and randomiza- tion process	Low – vari- ation across studies	No – ap- plicability to patient popula- tion	Low – as- sessment of sample size and confi- dence	Unlikely – judged from peer- reviewed status and design High (●●●●)
Mandall et al. (2024) [26]	RCT	Low – based on study de- sign and randomiza- tion process	Low – vari- ation across studies	No – ap- plicability to patient popula- tion	Low – as- sessment of sample size and confi- dence	Unlikely – judged from peer- reviewed status and design High (●●●●)

Table S4. Grading of Recommendation, Assessment, Development, and Evaluation (GRADE) analysis for the studies about treatments with miniscrews.

Study	Design	Risk of Bias	Incon- sistency	Indirect- ness	Impreci- sion	Publica- tion Bias	GRADE Quality
Ge et al. (2012) [21]	RCT	Low – ran- domization described, but limited info on allo- cation con- cealment	Low – simi- lar out- comes be- tween in- tervention arms	None – compara- ble groups and out- comes	Some – moderate group sizes, but sufficient effect sizes	Unlikely – well-de- signed and peer- reviewed	●●●●
Eissa et al. (2018) [23]	Non-RCT	Moderate – non-ran- domized, possible se- lection bias	None – consistent skeletal and dental ef- fects	None – appropri- ate patient popula- tion and interven- tion	Some – small sample size (n=16 per group)	Possible – less rigor- ous de- sign, but published in peer-re- viewed journal	●●●○
Seiryu et al. (2020) [25]	RCT	Low – proper ran- domization and blind- ing of out- come as- sessment	Low – dif- ferences be- tween FM and FM+MS group con- sistent	None – di- rect com- parison of FM vs FM+MS	Low – good power and sam- ple size calcula- tions	Unlikely – random- ized trial with reg- istration and ethics approval	●●●●
Kamel et al. (2023) [7]	RCT	Low – proper ran- domization and	None – consistent results	None – di- rectly ap- plicable to growing	Some – sample size	Unlikely – prospec- tive trial,	●●●●

	intention- to-treat analysis	within the group	Class III patients	limited af- ter drop- outs	peer-re- viewed
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