Supplementary Table 1: Assessment of Complications Profile.

Complication Type	Autologous Bone Graft		Bone Substitute		Risk Ratio (95% CI)	P-value	NNT/NNH
	n	Events (%)	n	Events (%)			
Infection	117	2 (1.71%)	167	4 (2.40%)	0.83 (0.21, 3.35)	0.80	145 (NNT)
Secondary collapse	171	63 (36.84%)	198	57 (28.79%)	1.21 (0.85, 1.71)	0.29	12 (NNH)
Any complication	171	65 (38.01%)	198	61 (30.81%)	1.18 (0.87, 1.60)	0.28	14 (NNH)

*Abbreviations: *NNT = Number Needed to Treat; NNH = Number Needed to Harm; CI = Confidence Interval*.*

Supplementary Table 2: Combined Outcome Score Analysis.

Outcome Component	Weight	Autologous Bone Graft	Bone Substitute	Standardized Effect Size	Weighted Contribution
Joint Depression	25%	Higher by 0.17 mm	Lower by 0.17 mm	-0.17	-0.0425
Secondary Collapse	25%	36.84%	28.79%	-0.1665*	-0.0416
Operative Time	20%	Longer by 16.79 min	Shorter by 16.79 min	-0.1679**	-0.0336
Blood Loss	20%	Higher by 70.49 ml	Lower by 70.49 ml	-0.7049**	-0.1410
Infection Rate	10%	1.71%	2.40%	0.1051*	0.0105
Combined Score	**100%**	-	-	-	**-0.2481**

*Abbreviations: *Standardized effect sizes represent the relative advantage of one treatment over the other, with negative values favoring bone substitute and positive values favoring autologous bone graft*.*

Supplementary Table 3: Risk of Bias Assessment Using Cochrane RoB 2.0 Tool.

Study	Randomization Process	Deviations from Intended Interventions	Missing Outcome Data	Measurement of Outcomes	Selection of Reported Results	Overall Risk of Bias
PERNAA et al. (2011)	Some concerns	Low risk	**High risk**	Low risk	Some concerns	**High risk**
JÖNSSON et al. (2015)	Low risk	Low risk	**High risk**	Low risk	Some concerns	**High risk**
HEIKKILÄ et al. (2011)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
RUSSELL et al. (2008)	Some concerns	Low risk	**High risk**	Low risk	Some concerns	**High risk**
HOFMANN et al. (2020)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
An Ru Pan et al. (2021)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Chen An Fu et al. (2020)	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk