

Evaluation of MagnetOs™ in Spinal Deformity Surgery: A Retrospective Case Review

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Background

Synthetic calcium phosphates with submicron surface topography have been demonstrated to grow bone in soft tissue, which provides an interesting alternative to autologous bone graft to reduce morbidity.^{1,2} The objective of this study was to evaluate the performance of a biphasic calcium phosphate with submicron surface topography in patients undergoing spinal deformity surgery with fusion.

Methods

A retrospective analysis was performed on a cohort of 44 patients who received corrective surgery with the calcium phosphate bone graft MagnetOs Granules or Putty (Kuros Biosciences, NL) in the posterolateral spine. Cobb angle measurement was performed pre- and post-operatively, and fusion was assessed using CT / X-rays at 6- and 12 months follow-up. 31/44 patients had reached 6 months follow-up, and 21/44 patients reached 12 months.

Results

Correction

Cobb Angle	Degrees, (σ)
Pre-operative	60.00° (21.03)
Post-operative	17.22° (10.49)
Mean correction	39.36° (18.79)
Correction rate	%, (σ)
Correction rate	71.94% (14.26)

Fusion

Fusion Rate*	%, (n/N)
Overall	93.5% (29/31)
6 months	93.5% (29/31)
12 months	100% (21/21)

* Data for 31/44 patients that reached 6 months follow-up, and 21/44 patients that reached 12 months follow-up.

Demography and indications

Age	years, (σ)
mean	31 (21)
median	18
range	5-74

Age category	years, n (%)
<20	24 (55)
20-40	7 (16)
40-60	6 (14)
>60	7 (16)

Surgery	n (%)
Primary	30 (68%)
Revision	14 (32%)

Number of levels, (σ)	
mean	12.5 (2.6)
median	12.5
range	4-17

Surgical Indication	n (%)
Scoliosis	36 (82)
Adolescent idiopathic	24 (55)
Degenerative	3 (7)
Syndromic	3 (7)
Congenital	2 (5)
Infantile idiopathic	1 (2)
Secondary syrinx	1 (2)
Osteogenesis imperfecta	1 (2)
Cerebral palsy	1 (2)
Kyphosis	9 (20)
Sagittal plane deformity	5 (11)
Scheuermann's disease	2 (5)
Post-traumatic	1 (2)
Iatrogenic	1 (2)



Figure 1. Left: post operative 3D reconstruction CT showing solid fusion. Middle: post-operative Sagittal CT image showing lumbar fusion. Right: post-operative Sagittal CT image showing lumbar fusion.

Complications

Complications included wound infection (1/44), sagittal imbalance (1/44), CSF leak (1/44), and proximal junctional kyphosis (1/44), which were not related to the bone graft. Pseudoarthrosis was identified in two adult revision cases of complex deformity corrections (2/44).

Conclusion

This study demonstrated the favorable performance of a novel synthetic biphasic calcium phosphate with submicron surface topography in spinal deformity surgery among a diverse cohort of patients with spinal pathology. The data highlight the **high fusion rates, correction rates, and safety** achieved with this bone graft material and are in agreement with findings from earlier clinical studies.³