

//
//

()

Novabone

cage

*

(Interbody cage)

Novabone

Solis

Novabone

Solis

(% /)

(% /)

Novabone

Solis

(% /)

(% /) level

/

level

/

% / % level

% / level

cage

Novabone

Novabone

Novabone

()

()

(Interbody Cage)

()

()

()

Novabone

cage

/

()

() PEEK

Stryker

Solis

Novabone

()

()

()

Bone Morphogenic protein ()

) Triosite () (Recombinant-BMP-2)

() (

Novabone

Medline Alta vista Google Pub med

level

Novabone

()

brace

bioactive glass Novabone

()

MRI

()

MRI

cage

Novabone

MRI

Novabone
(% /)

Solis

(% /)

Novabone

) PEEK

Stryker

Solis

Novabone

level	level
(SD ±)	(SD±)
/ ± /	/ ± / ()
/ ± /	/ ± / ()

level

(% /)

(% /)

(% /)

(% /)

lucency

:

alignment
() subsidence

Novabone

cage

/

(% /)

level

(% /) level

(% /)

(% /)

level

(% /)

MRI

C₅ C₆

(% /)

()

C₄ C₅ (% /)

C₆ C₇

(% /)

C₃ C₄ (% /)

cage

/

/

subsidence

(% /)

()

(% /)

level

Novabone

level

level

level	level	level	level	level	level
/	/	/	/	/	()
/	/	/	/	/	()

Novabone

()

ACDF

subsidence

()

Hacker

()

% /

ACDF

()

/
 % / level Bartel
 % / subsidence
 % / level Kao ()
 () % cage
 ACDF Barsa ()
 Hacker () %
 () Hacker
 Hacker ACDF cage
 ()
)
 cage () () Hacker (end plate
 Novabone (distraction
 cage
 ()
 cage level % / level
 Hacker % / %
 Campbell ACDF
 () () % Wilson
 () () Hacker Martin
 % ACDF
 Hacker ()
 cage % / % / level ACDF
 (Hacker HA-BAK/C , BAK/C)
 Solis % / level
 cage () % /
 () Kulkarmi
 cage Matge Schroder () Solis sage
 () () %
 cage Hacker Hacker

(% /) % / .()

Matge) Hacker
% cage cage :
MRI .() cage ()
Novabone

()
(osteoinductive)
() (osteoconductive)

(TCA)
% / .()
Novabone
()

(PLL)

case series ACDF Yang
Solis % /
() % /
(RCT) Matge
() cage
() % /

(end plate)
Novabone
Novabone

REFERENCES

1. Schroder J, Herbort M, Rustemeyer P, Vieth V, Wassmann H. Mechanical response of cervical vertebral endplates to axial loading. *Zentralbl Neurochir.* 2006; 14: 908-14.
2. Banwart JC, Asher MA, Hassanein RS: Iliac crest bone graft harvest donor site morbidity: A statistical evaluation. *Spine* 1995; 20: 1055-60.
3. Kanayama M, Hashimoto T, Shigenobu K, Oha F, Ishida T, Yamane S. Pitfalls of anterior cervical fusion using Titanium mesh and local autograft. *J Spinal Disord Tech* 2003; 16(6): 513-8.
4. Xia L, Wang YS, Wang LM, Zhai FY, Wang WD, Li JW. A comparative study on maintenance of disc height by different anterior cervical fusion methods. *Zhonghua Wai Ke Za Zhi* 2006; 44(16): 1094-7.
5. Lu KW, Jin DD, Wang J, Chen JT, Wang JX, Jiang JM, et al. Analysis of the long-term outcome of anterior approach surgery on cervical spondylotic myelopathy. *Zhonghua Wai Ke Za Zhi.* 2006; 44(16): 1091-3.
6. Schroder J, Grosse-Dresselhaus F, Schul C, Wassmann H. Anterior cervical spinal fusion with the Intromed ZWE System: preliminary experience. *Neurosurg Rev* 2006; 28: 1128-35.
7. Slivka MA, Spenciner DB, Seim HB, Welch WC, Serhan HA, Turner AS. High rate of fusion in sheep cervical spines following anterior interbody surgery with absorbable and non-absorbable implant devices. *Spine* 2006; 31(24): 2772-7.
8. Nabhan A, Ahlhelm F, Pitzen T, Steudel WI, Jung J, Shariat K, et al. Disc replacement using pro-disc C versus fusion: a prospective randomized and controlled radiographic and clinical study. *Eur Spine J* 2007; 16(3): 423-30.
9. Bartels RH, Donk R, Vander Wilt GJ, Grotenhuis JA, Venderink D. Design of the PROCON trial: a prospective, randomized multi-center study comparing cervical anterior discectomy without fusion, with fusion or with arthroplasty. *BMC Musculoskelet Disord* 2006; 70: 85.
10. Chen JF, Lee ST. The polymethyl methacrylate cervical cage for treatment of cervical disk disease Part III. Biomechanical properties. *Surg Neurol* 2006; 66(4): 367-70.
11. Pascal-Moussellard H, Brunet-Imbault B, Aguado E, Pilet P, Delplace S, Benhamou CL, et al. Experimental evaluation of microscan assessment of bone fusion. *Rev Chir Orthop Reparatrice Appar Mot* 2006; 92(6): 535-42.
12. Sekerci Z, Ugur A, Ergun R, Sanli M. Early changes in the cervical foraminal area after anterior interbody fusion with polyetheretherketone (PEEK) cage containing synthetic bone particulate: a prospective study of 20 cases. *Neurol Res* 2006; 28(5): 568-71.
13. Schmieder K, Wolzik-Grossmann M, Pechlivanis I, Engelhardt M, Scholz M, Harders A. Subsidence of the wing titanium cage after anterior cervical interbody fusion: 2-year follow-up study. *J Neurosurg Spine* 2006; 4(6): 447-53.
14. Ausman JJ. Evaluation of motion produced in adjacent segments after use of an anterior cervical cage or artificial cervical disc: evaluation of a recently published study in the *Journal of Neurosurgery Spine* 2005. *Surg Neurol* 2006; 65(5): 429-35.

15. Hacker RJ, Cauthen JC, Gilbert TJ, Griffith SL. A prospective randomized multi-center clinical evaluation of an anterior cervical fusion cage. *Spine* 2000; 25: 2646-55.
16. Mooney V, Massie JB, Lind BI, Rah JH, Negri S, Holmes RE. Comparison of hydroxyapatite granules to autogenous bone graft in fusion cages in a goat model. *Surg Neurol* 1998; 49(6):628-33.
17. Kanayama M, Hashimoto T, Shigenobu K, Oha F, Ishida T, Yamane S. Pitfalls of anterior cervical fusion using Titanium mesh and local autograft. *J Spinal Disord Tech* 2003; 16(6): 513-8.
18. Gu YT, Jia LS, Chen TY, Qi J, Wang J, Cui SF, et al. In vivo experimental study of hat type cervical intervertebral fusion cage. *Zhonghua Wai Ke Za Zhi*. 2006; 44(16): 1127-31.
19. Wang W, Kong L. Cervical cage migration. *J Neurosurg Spine* 2006;5(5): 479-80.
20. Cho DY, Lee WE, Sheu PC, Chen CC. Cage containing a biphasic calcium phosphate ceramic (Triosite) for the treatment of cervical spondylosis. *Spine* 2005; 63(6): 497-503.
21. Oonishi H, Kushitani S, Yasukawa E, Iwaki H, Hench LL, Wilson J, et al. Particulate bioglass compared with hydroxyapatite as a bone graft substitute. *Clin Orthop Relat Res* 1997; 334: 316-25.
22. Wheeler DL, Stokes KE, Hoellrich RG, Chamberland DL, McLoughlin SW. Effect of bioactive glass particle size on osseous regeneration of cancellous defects. *J Biomed Mater Res* 1998; 41: 527-33.
23. Cloward RB. The anterior approach for removal of ruptured cervical disks. *Neurosurgery* 1958; 15:602-17.
24. Nakase H, Park YS, Kimura H, Sakaki T, Morimoto T. Complications and long-term follow-up results in titanium mesh cage reconstruction after cervical corpectomy. *J Spinal Disord Tech* 2006; 19(5): 353-7.
25. Kao FC, Niu CC, Chen LH, Lai PL, Chen WJ. Maintenance of interbody space in one- and two-level anterior cervical interbody fusion: comparison of the effectiveness of autograft, allograft, and cage. *Clin Orthop Relat Res* 2005; 430: 108-16.
26. Bartels RH, Donk RD, Feuth T. Subsidence of stand-alone cervical carbon fiber cages. *Neurosurgery*. 2006; 58(3): 502-8; discussion 502-8.
27. Barsa P, Suchomel P. Factors affecting sagittal malalignment due to cage subsidence in standalone cage assisted anterior cervical fusion. *Eur Spine J* 2007; 13: 508-15.
28. Wilson DH, Campbell DD. Anterior cervical discectomy without bone graft: Report of 71 cases. *J Neurosurg* 1977; 47: 551-5.
29. Martins AN. Anterior cervical discectomy with and without interbody bone graft. *J Neurosurg* 1976; 44: 290-5.
30. Kulkarni AG, Hee HT, Wong HK. Solis cage (PEEK) for anterior cervical fusion: preliminary radiological results with emphasis on fusion and subsidence. *Spine J* 2007; 7(2): 205-9.
31. Schroder J, Grosse-Dresselhaus F, Schul C, Wassmann H.. PMMA versus Titanium cage after anterior cervical discectomy - A Prospective Randomized Trial. *Zentralbl Neurochir* 2007;68(1):2-7.

-
32. Yang P, Wang K, Gong F. Comparison among solis cage, titanium cage, and autogenous iliac crest graft combined with titanium plate in treating prolapse of cervical intervertebral disk. *Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi* 2006; 20(10): 1026-30.
 33. Slivka MA, Spenciner DB, Seim HB 3rd, Welch WC, Serhan HA, Turner AS. High rate of fusion in sheep cervical spines following anterior interbody surgery with absorbable and nonabsorbable implant devices. *Spine* 2006; 31(24): 2772-7.
 34. Gu YT, Jia LS, Chen TY, Qi J, Wang J, Cui SF, et al. In vivo experimental study of hat type cervical intervertebral fusion cage. *Zhonghua Wai Ke Za Zhi* 2006; 44(16): 1127-31.
 35. Matge G. Cervical cage fusion with 5 different implants: 250 cases. *Acta Neurochir (Wien)* 2002; 144(6): 539-49.
 36. Stevenson S. Biology of bone grafts. *Orthop Clin North Am* 1999; 30: 543-52.
 37. Chase SW, Herndon CH. The fate of autogenous and homogenous bone graft: A historical review. *J Bone Joint Surg Am* 1995;37(4):809-41.
 38. Yang P, Wang K, Gong F. Comparison among solis cage, titanium cage, and autogenous iliac crest graft combined with titanium plate in treating prolapse of cervical intervertebral disk. *Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi* 2006; 20(10): 1026-30.