Spinal reconstruction using recombinant human bone morphogenic protein after total spondylectomy

2003 Fiscal Year Final Research Report Summary

spinal reconstruction using recombinant human bone morphogenic protein after total spondylectomy

Research Project

Project/Area Number

14571366

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

Orthopaedic surgery

Research Institution

KANAZAWA UNIVERSITY

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Project Period (FY)

2002 – 2003

Keywords

bone morphogenetic protein / spinal tumor / spinal fusion

Research Abstract

20 Dogs underwent total spondylectomy of TI3 and spinal reconstruction with titanium mesh cage using autogeneous bone graft(resected vertebral body) and recombinant human bone morphogenetic protein-2(rhBMP-2) to evaluate bone remodeling and fusion.
Control group(autogeneous bone graft n=10):had the titanium cage reconstruction filled with autogenous bone, and BMP-treated group(n=10):had reconstruction with the titanium cage filled collagen sponge soaked with rhBMP-2. 5 dogs of each group were killed 8weeks(group A) and 16 weeks(group B) after the surgery and we evaluated bone remodeling and fusion by imaging test(Xp, CT scan) and histologic examination.
Imaging test revealed bone fusion in all specimens with the exception of one pseudoarthrosis in the control group. Histologic examination showed 4 of 5 dogs in control group A had normal lamella of trabecular bone formation from the endplate of the adjacent vertebral bodies towards the center of the cage, and woven bone was present around the center of cage. It is considered to be a progress of remodeling. The other one dog had pseudoarthrosis. 3 of 5 dogs in control group B achieved consecutive trabecular cancellous bony fusion between adjacent vertebral bodies. The other two had more progressive abone formation towards the center of the mesh compared to the control group A. It is considered that bone fusion is going to be progressed.
In BMP-treated group A, there were progressive bone formation towards the center of the mesh. All the 5 dogs in BMP-treated group B achieved consecutive trabecular cancellous bony fusion between the grafted bone and adjacent vertebral bodies.
Both groups could have favorable bone fusion, but BMP-treated group had more trabecular bone formation throughout the length of the mesh than control group.
This study confirms rhBMP2 augment bony fusion and remodeling on vertebral reconstruction after total spondylectomy.

Research Products (8 results)

All | 2005 | 2004 | 2002

All | Journal Article (8 results)

- [Journal Article] Influence of acute spinal shortening on the spinal cord : An experimental study — 2005
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- [Journal Article] Interruption of the bilateral segmental arteries at several levels : Influence on — 2004
- [Journal Article] Interruption of the bilateral segmental arteries at several levels : Influence on vertebral blood flow — 2004
- [Journal Article] Healing of autologous bone in a titanium mesh cage used in anterior column reconstruction after total spondylectomy — 2002
- [Journal Article] Thyroid cancer spinal metastases : Report on 25 operations in 14 patients. — 2002
- [Journal Article] Healing of autologous bone in a titanium mesh cage used in anterior column reconstruction after total spondylectomy — 2002
- [Journal Article] Thyroid cancer spinal metastases : Report on 25 operations in 14 patients — 2002

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