

# Reconstruction of the Cervical Spine in Cervical Myelopathy Using an Anterior Distraction Device

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*Methods:* Distractable vertebral body replacement (ADD<sup>plus</sup>, Ulrich Medizintechnik, Germany) were used for the reconstruction of the cervical spine in patients with cervical stenosis and myelopathy. A typical anterior approach to the cervical spine was performed. A high speed drill system was used for resection of the vertebral bodies. The vertebral body were replaced by ADD-Implantat.

*Results:* Between 1999 and 2004 42 patients (average 63,2 yr follow up ranged 4 month to 5 yr) underwent this procedure. No technique-related complications were observed. Clinical symptoms improved in 71%, no change respectively each in 26%, in one case (severe myelopathy) it was worse.

*Conclusions:* The implantat ADD<sup>plus</sup> is a very simple and safe technique to replace cervical vertebral bodies. The surgical technique is very comfortable because the implantat is distractable in situ .

## Introduction

Cervical myelopathy is a neurological disorder caused by the narrowing of the spinal canal as a result of degenerative changes in cervical spine. It is at most a problem of elderly patients.

Anterior approaches with central corpectomy has been shown to be an effective method for the treatment of cervical myelopathy (3). The structural integrity may be restored with autograft (iliac crest, fibula) or allograft combined with the placement of instrumentation. Simpler is usage of cage-systems (1,2).

We report our experiences with distractable vertebral body replace-

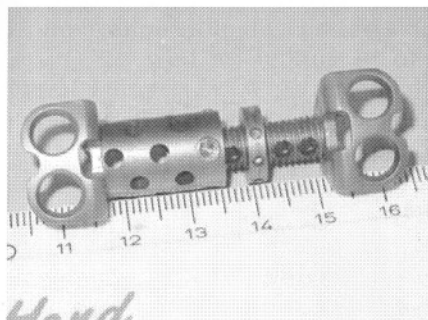


Fig.1 ADD<sup>plus</sup> Implant (Ulrich medizintechnik, Ulm, Germany).

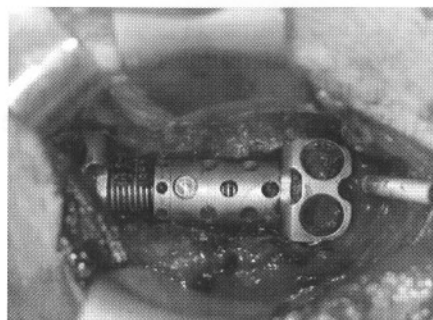


Fig.2 ADD<sup>plus</sup> in situ.

ment (ADD and ADD<sup>plus</sup>, Ulrich Medizintechnik Ulm, Germany), (Fig.1,2).

### Clinical Material and Methods

Between 1999 and 2004 42 patients (12 females, average 64 yr, 30 males, average 62,5 yr) underwent cervical corpectomy. A typical anterior approach to the cervical spine was performed. The unaffected adjacent vertebral bodies were fixed using the Caspar distractor. For resection of the vertebral bodies a high speed drill system was used. The dorsal longitudinal ligamentum was completely resected. Between 1999 and 2001 ADD implants were used (without wings, 8 cases) in combination with a cervicale plate. Since 2002 ADD<sup>plus</sup> implant is equipped with plates (wings) at both ends making the attachment of this „single-

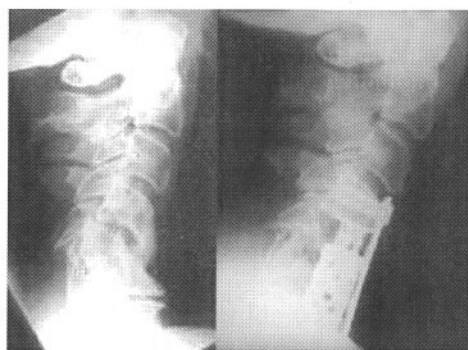


Fig.3 left: preoperative MRI cervical stenosis after laminectomy 12 years ago with myelopathy and syrinx, right: postoperative MRI with implant ADD.

Fig.4 same case Fig.3, x-ray left: preoperative, right: postoperative, ADD with plate.

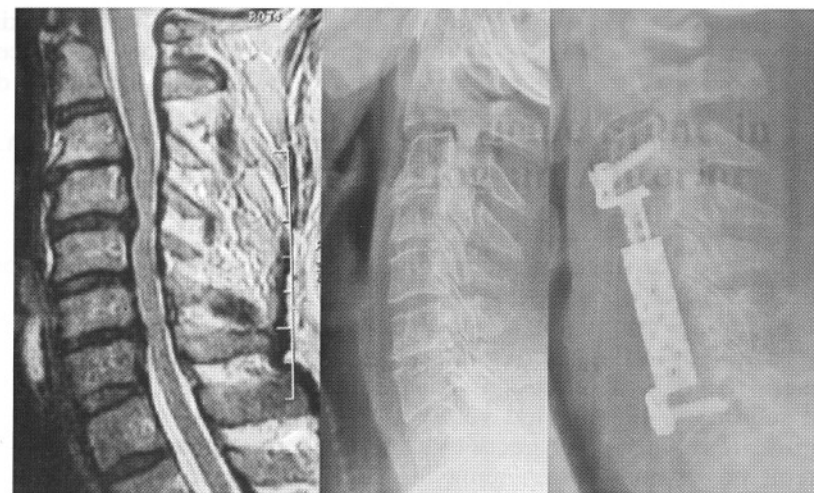


Fig.5 multisegmental cervical stenosis with myelopathy, left: preoperative MRI, middle: preoperative x-ray, right: postoperative x-ray, ADD<sup>plus</sup>-Implant

piece” implant to the adjacent levels possible. Standard cortical screws are used. In cases of osteoporosis expandable screws are used (osmium-system, Ulrich Medizintechnik Ulm). Postoperatively the neck was immobilised by a strengthened neck collar for 4 weeks, after x-ray, showed good implant site a rehabilitation is effected depending on the neurological deficit.

### Results

The number of resected vertebral bodies is shown in Tab.1. Before surgery clinical symptoms was severe in 11, moderate or beginning myelopathy in 29 cases. In 2 cases appeared acute myelopathic symptoms after trauma and an existing cervical stenosis. Five patients did not suffer preoperatively from any radicular failures. Postoperatively, an improvement (neurological status 10 days after surgery) was found in the case of 71% (strongly improved 31%, improved 39%). In the case of 11 (26%) outcome was not improved or similar. In 1 patient (severe myelopathy), the situation deteriorated.

Tab. 1 Number of resected vertebral bodies

Vertebral bodies	1	2	3
n patients	12	26	4

Complications found were: secondary haemorrhages (1), screws working loose (4), as well as sinking in of the implant in relation to adjacent vertebral bodies (2). A patient died 3 days after surgery of cardiac decompensation. Revisions were necessary in 5 cases, in the cases of screws having worked loose, expanding screws used for reoperation.

## Discussion

In our opinion, the implant is easy to handle, implant-related complications did not occur.

No additional removal of a bone graft will be necessary. The time for the operation is quite shorter than for other implant procedures and decreases the risk of additional complications. For filling the implant, bone sections of the resected vertebral bodies were used, an additional spongiosa removal is not necessary. Overall, this technique represents an excellent method for replacing the cervical vertebral bodies. Due to the various different implant sizes and the distraction capability, a troublefree adaptation to the surgical situs is possible.

With regard to the clinical results, it becomes clear that for severe cases of myelopathy the trend towards improvement does not correspond with the expectations of patients. This leads to the conclusion that the indication for surgery must be provided as early as, even taking into account increased life expectancy.

## References

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