



Failure of an expandable cage-plate cervical vertebral body replacement: case report of a device related complication

Genişleyebilen kafes-plak servikal vertebral gövde replasmanında başarısızlık:
Cihazla ilişkili komplikasyon üzerine olgu sunumu

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ABSTRACT

Instabilities of the cervical spine after complete or incomplete corpectomy may be the result from resection due to stenosis induced myelopathy, tumors, infections or fractures. In this article, we report a 49-year-old female patient after surgical decompression and stabilization at C5/7 with permanent cervicobrachialgia due to cervical stenosis at C5/7. Corpectomy of C6 and stabilization of C5/7 were performed with a combination of cage and plate. At an outpatient control 16 months after reoperation, the patient complained of neck pain, while the control X-ray showed a fracture of the implant. Due to instability of the device, a revision was indicated, resulting in removal of all components with restabilization. Definitive stabilization was performed with a PINA® cage, discectomy and cage implantation at C4/5 and C7/Th1 and a plate from C4 to Th1 with screw fixation in C4/5/Th1. Postoperative course was complication free and the patient was without pain or neurological symptoms at follow-up after 12 months with all implants in radiologically regular position. To the best of our knowledge, this is the first case report to describe such a complication.

Keywords: Arthroplasty; breakthrough pain; replacement; spine.

ÖZ

Komplet veya inkomplet korpektomi sonrası servikal omurgada instabilite stenozun indüklediği miyelopati, tümörler, enfeksiyonlar veya kırıklara bağlı rezeksiyondan kaynaklanabilir. Bu yazıda, C5/7'de servikal stenoz nedeniyle cerrahi dekompresyon ve kalıcı servikobrakialji ile C5/7'de stabilizasyon sonrasında 49 yaşında bir kadın hasta sunuldu. C6'da korpektomi ve C5/7'de stabilizasyon kafes ve plak kombinasyonu ile yapıldı. Tekrar ameliyattan 16 ay sonraki ayaktan kontrolde hasta boyun ağrısından yakınırken kontrol röntgeninde implantta kırık görüldü. Cihazdaki instabilite nedeniyle revizyon endike olduğundan restabilizasyon ile tüm bileşenler çıkartıldı. Kesin stabilizasyon PINA® kafesi, diskektomi ve C4/5 ve C7/Th1 kafes implantasyonu ve C4/5/Th1'de vida fiksasyonu ile C4'ten Th1'e bir plak ile yapıldı. Ameliyat sonrası seyir komplikasyonsuzdu ve 12 ay sonraki takipte hastada ağrı veya nörolojik semptom yoktu ve tüm implantlar radyolojik olarak düzgün konumda idi. Bildiğimiz kadarıyla böyle bir komplikasyonu açıklayan ilk olgu sunumu budur.

Anahtar sözcükler: Artroplasti; ani ağrı; replasman; omurga.

Instabilities of the cervical spine after complete or incomplete corpectomy may be the result from resection due to stenosis induced myelopathy, tumors, infections or fractures.^[1-5] Expandable and non-expandable cages have gained acceptance for replacement of the vertebral body. Stabilization can be achieved by additional anterior plating or posterior stabilization by a rod and screw system. Alternatively, a direct fixation of the cages with fixation wings is possible, a combination of two systems in one - cage

and fixation system.^[6,7] Thus, donor site complications are avoided and fast and strong reconstruction of the anterior column is provided under normal healing conditions. This report presents a case of failure and its treatment.^[8]

CASE REPORT

A 49-year-old female patient presented with therapy refractory pain 16 months after surgery in another department. Surgical decompression and



Figure 1. Lateral X-ray of cervical spine after surgery with persisting stenosis and pain.

stand-alone stabilization at C5/7 were performed (Figure 1). Permanent left C6 cervicobrachialgia was treated conservatively including computed tomography (CT) guided infiltrations without relief of symptoms for more than one year. After presenting

at our department, a new CT was performed resulting in a cervical stenosis at C5/7 with *in situ* cages. Due to clinical and imaging findings, a reoperation of the cervical spine was performed by corpectomy of C6 and stabilization of C5/7 with a combination of a cage and plate (ADDplus, anterior distraction device; Ulrich medical, Ulm, Germany) (Figure 2a and b). An ADDplus implant (CS 2253-X) with 0° angulation, 12 mm diameter and a distraction height of 13-18 mm was used, while fixation was established by a locking screw and four osmium screws (CS 1300-X) with a diameter of 5 mm. Postoperative images showed the implant *in situ* with regular orientation. The clinical course was without complications. At an outpatient control 16 months after reoperation, the patient complained of neck pain without trauma or neurological deficit. The control X-ray showed a fracture of the implant - a breakage of the cage on the lower rim could be detected (Figure 3). Due to instability of the device, a revision was indicated, resulting in removal of all components with restabilization. The choice of implant was dependent on the intraoperative situs. The osmium screws could not be removed totally, due to breakage of the distal parts staying in the bone (Figures 4-7). Instability of the adjacent levels of C4/5 and C7/Th1 was the indication for inclusion of the two segments. Definitive stabilization was performed with a PINA® cage (PINA® Medizintechnik Vertriebs AG, Thayngen, Schweiz), discectomy and cage implantation at C4/5



Figure 2. (a, b) Postoperative radiograph after corpectomy at C6 and implantation of ADDplus device (a: anteroposterior view, b: lateral view).

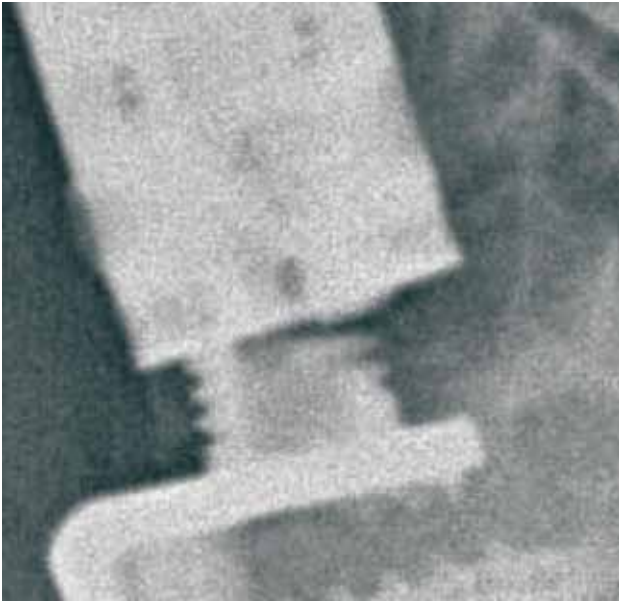


Figure 3. Lateral X-ray of cervical spine showing broken device.



Figure 5. Broken osmium screws.



Figure 4. Lateral intraoperative X-ray of cervical spine showing broken osmium screws.



Figure 6. Intraoperative photo showing broken osmium screw holes.



Figure 7. Intraoperative photo showing broken ADDplus device.



Figure 8. (a, b) Postoperative radiograph after definitive reoperation (a: anteroposterior view, b: lateral view).

and C7/Th1 and a plate from C4 to Th1 with screw fixation in C4/5/Th1. Postoperative course was complication free and the patient was without pain or neurological symptoms at follow-up after 12 months with all implants in radiologically regular position (Figures 8a and b). A written informed consent was obtained from the patient.

DISCUSSION

Treatment of cervical spondylotic myelopathy has developed via the anterior approach from single level discectomies to corpectomy with cage replacement.^[1-5] A new advanced method is use of expandable titanium cages which allow easy replacement with *in situ* expansion and reproduction of the sagittal profile.^[9-13] Stabilization can be achieved by additional anterior plating or posterior stabilization by a rod and screw system. Alternatively, a direct fixation of the cages with fixation wings is possible, a combination of two systems in one - cage and fixation system.^[6,7] Expandable cages are adjustable in height and can be inserted easier without the need to cut the edges, with fewer traumas to the endplates by *in situ* expansion. The kyphosis is progressively corrected with the expansion of the cage, while overdistracted must be avoided to preserve integrity of adjacent structures and prevent neurological complications. Treatment of cervical spondylotic myelopathy via anterior corpectomy results in postoperative neurological improvement and superior quality

of life. Complications of the anterior approach are dysphagia, graft extrusions, and spinal fluid leaks. The incidence of dysphagia is different ranging from no high risk^[12] to one of 26 temporary^[11] or 20% at six months, with an excellent fusion rate for single level corpectomy.^[12,13] Long segmental reconstruction for multilevel corpectomy is associated with a higher rate of failure between 9% and 67%. A comparison of anterior distraction cages with plating (n=16) or wing fixation (n=28) revealed that the latter carries a higher risk of non-fusion and loss of lordotic correction and height at 12 months follow-up.^[7] Implantation is easier by direct attachment of fixation wings, but seems to have some additional risks. To our knowledge, this is the first report of breakage of the construct which needed the explanation of all parts. The removal of the osmium screws is not totally possible which comprises the following restabilization. The residual place for screws is reduced by big holes and residual screw residues. In our case, the indication for a longer stabilization was therefore somehow “lucky” because the plate could be fixed stable after inserting the monoblock PINA cage.

Declaration of conflicting interests

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