THE "EGG SHELL" PROCEDURE

M. GÜLŞEN * S. ÖZBARLAS * M. HERDEM * G. BAYTOK *

ABSTRACT:

In this article we would like to present the early results of 18 cases with different diagnosis that were surgically treated with "egg shell" procedure. Of 18 patients, 5 were female, 13 were male and, the mean age was 32 years with a range of 13-45. In this series of cases 11 were ankylosing spondylitis, 2 were rheumatoid spondylitis, 3 were congenital scoliosis and 1 was trauma and 1 was tumor. This procedure was used for deformity correction, tumor removal and canal decompression.

Key words: *Egg shell procedure, ankylosing spondylitis*

INTRODUCTION

The posterior transpedicular "egg shell" procedure is described by Michele (5) and popularized by Heinig (2). This technique provides de cancellation of the corpus via posterior route. Excision of the hemivertebra in congenital scoliosis by using "egg shell" technique is a well established and accepted technique (4). Jaffray, Becker and Eisenstein (3) reported three cases and Simmons (6) declared one case of ankylosing spondylitis treated with this technique with excellent corrections. This technique can also be used for tumor removal and canal decompression (1).

MATERIAL and METHOD

We operated 18 patients with "egg shell" procedure. There were 13 males and 5 females, and the average age of the patients were 32 years with a range of 13-45. The diagnoses were ankylosing spondylitis in 11, rheumatoid spondylitis in 2, congenital scoliosis in 3, tumor (solitary bone cyst) in 1 and trauma (old burst fracture with canal compression) in 1 case. This procedure was used for deformity correction, tumor removal and canal decompression.

All patients were operated under endotracheal general anesthesia. After the desired amount of laminectomy, cancellous bone of the corpus was curetted out via transpediculer route. Posterior cortex of the corpus is then broken with a blunt and angled instrument in deformity or canal compression cases, for correction or decompression. Internal fixation with ISOLA system was used in all cases except tumor and cervical osteotomy for ankylosing spondylitis cases.

Vertebral levels that the procedure is used and the diagnoses are shown in Table 1.

RESULTS

Table 1. Diagnoses and the procedure levels

	C7	T12	L2	L3	Total
Ankylosing spondylitis	1			10	11
Rheumatoid spondylitis			1	1	2
Congenital scoliosis		1		2	3
Trauma				1	1
Tumor				1	1
Total	1	1	1	15	18

We measured kyphosis and scoliosis angles in deformity cases. Overall corecctions were 28.7 degrees in ankylosing and rheumatoid spondylitis cases and 14 degrees in scoliosis cases (figures 1 and 2). Solitary bone cyst could be removed completely, and in trauma cases canal was decompressed successfully.

In spondylitis cases, dramatically postural changes were observed immediately after the operations, such as the patients could touch their heads to the bed in supine position, and their abdominal skin folds were opened. When the patients were mobilized with external support, all were satisfied with postural changes.

The mean follow up time was 6 months (range 3-12 months).

* Department of Orthopaedics and Traumotolgy, Faculty of Medicine, University of Çukurova, Adana.

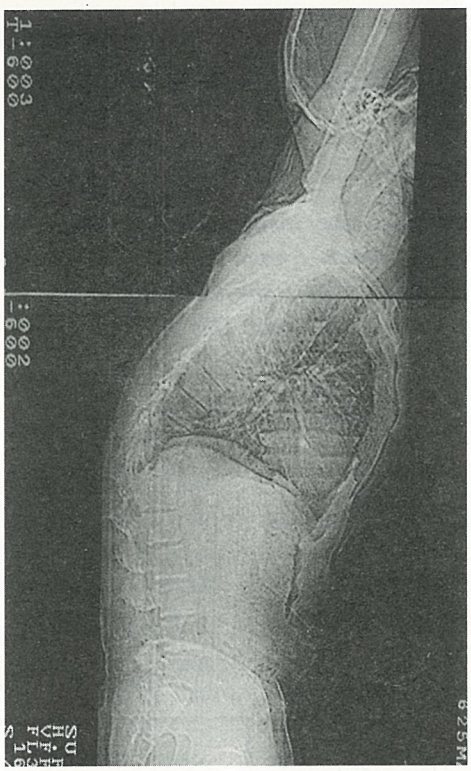

Figure 1. An ankylosing spondylitis case
Fig. 1 A. Preoperative composite scanograph

Complications: We had loss of correction in two cases. Both were ankylosing spondylitis cases that we used only transpedicular screws and loss of corrections were 10 degrees in each patients. After these complications, we made modification in the fixation manner and we added hooks to the both sides at upper and lower ends to make claws. Minor root compression that resolved in 6 months is observed in another ankylosing spondylitis case.

DISCUSSION

The "egg shell" technique is "one stage, one approach" procedure that allows deformity correction, tumor removal and canal decompression via posterior route in various clinical conditions. It is now widely used in congenital lumbar scoliosis cases (4). Application of this technique in ankylosing spondylitis cases provides very safe and effective correction (3). Classic technique of spinal osteotomy in ankylosing spondylitis is an open wedge posterior spinal osteotomy. The egg shell procedure enable us to perform closed wedge posterior osteotomy in these cases, since cancelleous bone of the corpus is removed, and the posterior wall of the corpus is fractured. The danger of rupture of the anterior great vessels or avulsion of the lumbar radicular vessels are reduced, because the anterior column is not forcibly elongated. Healing of the closed wedge osteotomy will be rapid since two cancellous surfaces are compressed together.

The "egg shell" procedure is versatile technique. It is technically demanding, but it allows us one stage posterior approach to the vertebral body for deformity correction, tumor removal or canal decompression.

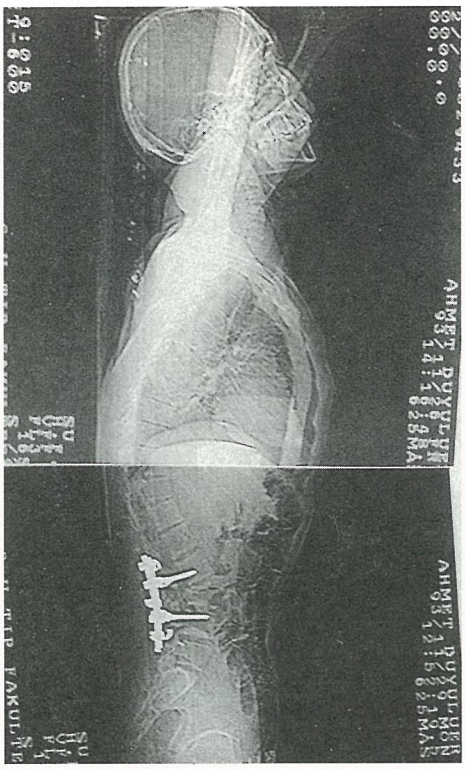

Figure 1. An ankylosing spondylitis case
Fig. 1 B. Postoperative composite scanograph

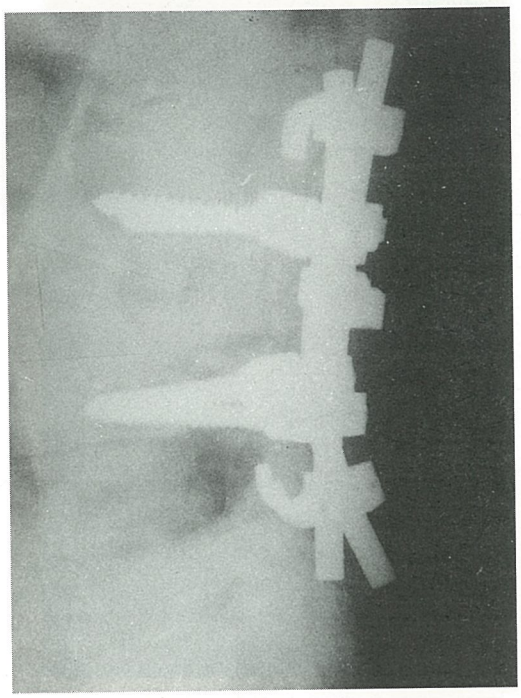

Figure 2. Egg shell procedure and laminar - pedicular claws in an ankylosing spondylitis case.

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