EGG-SHELL PROCEDURE IN CORRECTION OF NEGLECTED CASES OF POTT'S KYPHOSIS

M. KARAHAN MD.*, O. GÜVEN MD.**, S. YALÇIN MD.*

SUMMARY :

Residual kyphosis secondary to old and healed cases of spinal tuberculosis causing disability are still encountered. The standart double stage operation with anterior osteotomy and posterior instrumentation and correction has its drawbacks. We planned to employ the Egg-shell procedure to treat lumbar Pott's kyphosis in a single stage operation. Three patients with lumbar Pott's kyphosis (at L1, L2-3 and L5 respectively) were operated with a single stage posterior approach by evaluation of the wedged vertebral body via the transpedicular route. After the insertion of pedicular screws above and below, correction was obtained by coliapse of the Egg-shelled segment. There were no neuroogical complications. The pre- and postoperative kyphosis angles were as follows: 97° – 37°, 42°, 37° – (–10°) respectively. The average correction was 53,3° mean. The patients were mobilized carefully within the first postoperative week with light orthoses. They healed uneventfully and returned to active social life within six to nine months.

Conclusion: The Egg-shell procedure is a safe and reliable method in the correction of short segmented, sharp kyphosis like the deformities seen in Pott's disease. In this single stage operation the patient encounters less morbidity and early fusion is usually obtained.

***Key words** : Spinal tuberculosis, kyphosis, Egg-shell operation.*

INTRODUCTION

Kyphosis is one of the most important concerns of spinal surgery. Rather than a single appropriate method, treatment is individualized and based on the primary cause. Pott's tuberculosis is still a significant cause in the etiology of kyphosis especially in some countries. In the treatment of Pott's tuberculosis, although healing is almost always achieved, residual kyphosis remains as the major problem despite several different methods of treatment (1, 2, 7, 9). Conservative ambulatory treatment may result in anterior bone loss resulting in a high degree of residual kyphosis (5, 8, 10). Posterior fusion alone and even the Hong-Kong method results in a high rate of residual kyphosis (3, 8, 9). It is stated that this remaining kyphosis cannot be acceptable and surgical correction is mandatory (1, 2, 6, 9).

We, here present a method with which high degree curves of post-tuberculosis kyphosis in three patients were corrected with the "Egg-shell" procedure.

* Assistant Professor, Marmara University School of Medicine, Department of Orthopedics and Traumatology, Istanbul, Turkey.

** Associate Professor, Marmara University School of Medicine, Department of Orthopedies and Traumatology, Istanbul, Turkey.

Case 1: (S.M.) A 33 years-old female patient complained of back pain ascribed to childhood Pott's discase. Physical examination revelaed lumbar gibbosity, a disturbance of balance to anteriorly and a decrease in torso height. The remainder of the physical examination, including a thorough neurological examination was normal as well as the laboratory findings.

Radiology: Radiographies demonstrated L2 and L3 corpi fusion resembling a posterior seated hemivertebra and the corresponding anterior segments of L1 and L4 were found to be touching each other. The kyphosis angle measured with the Cobb's method was 50°.

Operation: The patient was placed prone on the Relton-Hall frame. The spine was exposed via a standart posterior longitudinal approach. The pedicules of T12, L1 and L2 were marked by Kirschner wires with the help of an image intensifier. The spinous processes and laminas of L1 and L2 were excised exposing both the spinal cord and the roots. The spongious bone of L1 and L2 were evacuated through the bilateral pedicules of L1 and L2. The posterior cortices were removed with a Kerrison rongeur. Pedicular screws were inserted at the adjacent vertebrae above and below the evacuated segment. The deformity was corrected by

forceful manipulation. The Cotrel-Dubousset Instrumentation (CDI) system was constructed and posterior fusion was performed. The estimated blood less was 800 cc. The patient was kept in bed for four weeks postoperatively and mobilized with a TLSO brace later. Solid fusion was achieved radiographically at ten months. The postoperative sagittal angulation of the corrected segments was –7° (lordosis).

Case 2: (N.Y.) A 37 year old female was admitted with complaints of back deformity and severe back pain which began after childhood Pott's disease. Physical examination revealed a sharp lumbar gibbosity at the thoracolumbar junction and decreased torso height. There was no neurological deficit and laboratory findings were normal.

Radiology: The lateral spinal X-ray revealed a kyphosis angle of 97° between the T11 and L3 vertebrae. The corpi of T12, L1 and L2 were fused anteriorly becoming wedge-shaped. The spinal cord was angulated and leaned on the anterior wall of the spinal canal on MRI.

Operation: The operation was performed in the same manner. Kyphosis angle decreased to 37° postoperatively. Solid fusion was determined radiographically at ten months.

Case 3: (G.K.) An 57 years old female patient admitted to our clinic hospital with low back pain and deformity at the lumbosacral region. In physical examination severe kyphosis was seen just at the lumbosacral junction. She was suffering of imbalance in the sagittal plane. She had had bilateral total hip arthroplasties 12 months before.

Radiology: There was a kyphosis in the lumbosacral junction and L5 vertebral body was wedge shaped. There was solid bony fusion between L4 and S1 anteriorly. The kyphosis angle was 37° between the inferior surface of L4 and superior surface of S1.

Operation: The operation was performed with the same method by transpedicular decancellation. The kyphosis angle decreased to –10° of lordotic contour postoperatively. The patient was followed for 18 months and healed completely without any complications.

DISCUSSION

It should be noted that postoperative residual kyphosis following simple eradication of the disease focus presents an important social and functional problem for the patient with Pott's disease of the spine (1, 2, 3). Moon (6) was the first to attract attention to this fact. He offered a solution by supplementing disease eradication with posterior instrumentation, fusion and correction of the deformity to achieve a better result of treatment (7). He noted that hunchback patients live a secluded life; they are isolated from social activities and their professions are mostly sedentary jobs. Up to now the following methods have been used to correct the kyphosis caused by spinal tuberculosis (7):

a. One-stage operation (posterior closing wedge osteotomy according to Galvestone)

b. Two-stage operation (anterior release with bone graft, followed by posterior rodding)

c. Three-stage operation

d. Multi-stage operations (osteotomy, halopelvic device, posterior rodding and fusion)

In the lumbar region any amount of kyphosis is highly untolerable. It causes severe balance disturbance in sagittal plane and resultant back pain. Secondary arthritic changes follow this deformity (11).

In the kyphotic adult patient, distraction should definitely be avoided during correction. The "Eggshell" procedure which was described by Heinig (4) permits a satisfactory correction posteriorly. In this procedure the posterior column is shortened and the cord is slackened.

While anterior strut grafting is necessary in conventional methods, this is not necessary in the "Eggshell" procedure, because of the spongious bone surfaces that are compressed against each other after anterior excavation of the wedge shaped vertebrac. Upper and lower segment discectomy is not necessary.

CONCLUSION

The objective of the performance of this method for the correction posttuberculosis kyphosis is to avoid further anterior surgery which is necessary to achieve anterior fusion and to decrease the operative morbidity. With this method one can perform anterior fusion by decancellation of the vertebral body and closing the cortices face to face by a single stage posterior approach. This is a safe method for correction because of the lack of distraction on the spinal cord.

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