

## ANTERIOR CERVICAL FUSION WITH BONY SCREW

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### ABSTRACT:

*Anterior approach has been extensively used for cervical fractures and disc pathologies for the last 40 years. Cloward operation is the most popular procedure for such cases. Very few modifications have been proposed for this operation.*

*Complications of this operation are trauma to the spinal cord and nerve roots during the hammering, insufficient stabilization and dislocation of the graft.*

**Key Words:** *Anterior fusion, Bone graft, Cervical disc, Cloward operation, Instrumentation, Operation technique, Screw shaped graft, Spinal injury*

### INTRODUCTION:

There have some criticism recently on Cloward method which is widely used in the treatment of cervical pathologies for the last 40 years. Some of these are micro even macro traumas on the spinal cord and spinal roots during hammering of the graft, sometimes dislocation, inadequacy in the stabilization of fractured dislocations, leaping of the graft, with fractures total scattering of vertebral body (corpus), and most of all the stress and fear of the surgeon during hammering (3- 14, 15, 17, 25, 29, 39). With the new developed method it is believed that all the negative factors mentioned above are totally eliminated.

### MATERIAL AND METHOD:

The new developed triple apparatus is the combination of a compressing device, a depth adjustable diestock and a graft inserting device (Fig. I, II, III).

Beginning of the operation is the same as Cloward operation. Once (first) the cylindrical graft is obtained from iliac crest using the basic Cloward procedure. The graft is placed into the compression threading device which is manually operated. The compression device immediately forms sharp and firm threads on the surface on the graft. Now cylindrical graft is ready to be screwed into the receiving bed.

Before the insertion of the graft (Which is 2 mm larger than the receiving bed) into the intervertebral space disc material is removed in usual manner with microsurgical technique via the previously opened burr

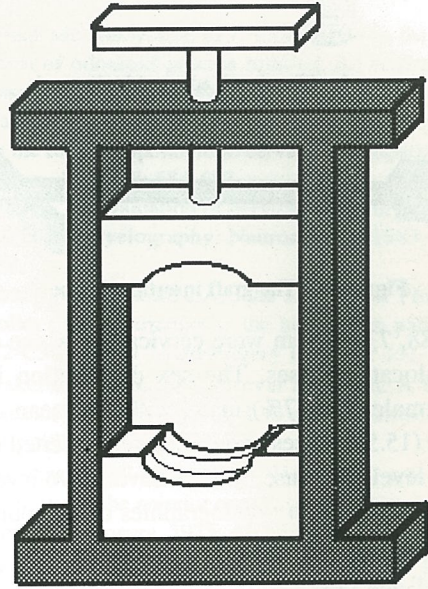


Figure 1. The compression device

hole. Then the depth adjustable diestock is introduced in order to thread the receiving bed, to match the graft.

When the threaded graft is obtained, before the graft is released from the compression device, the inserting device is applied to the threaded graft by screwing. Tip of the inserting device is screw shaped so that it fits introduction of the graft. The graft is inserted into the receiving bed by pushing gently and screwing. Then wounds are closed as usual.

### RESULTS:

77 cases were operated with this technique since

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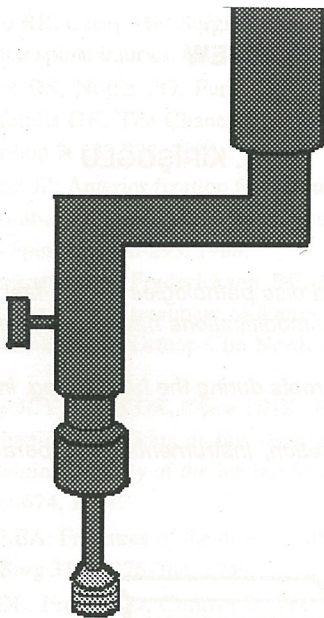


Figure 2. The depth adjustable diestock

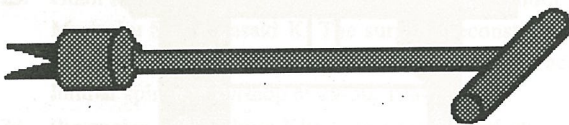


Figure 3. The graft inserting device

early 1988. 73 of them were cervical discs, the others were dislocation cases. The sex distribution is 41 (53%) female, 36 (47%) male, with the mean age of 27. In 12 (15.5%) cases two grafts were inserted in two different levels, because of them having two level disc protrusion found with myelographies of computed tomographic (CT) scan. Plain and functional X-rays were obtained on the first postoperative day in all cases and reobtained between 2-8 months intervals. Cervical CT was taken on several occasions.

During the same period 62 patients were operated for cervical discs with

simple discectomy (8 cases) or standart Cloward (54 cases) operations. 32 patients were operated for cervical traumas, dislocations operated with Cloward + interbody fusion and vertebrae compressions with vertebrectomy + interbodyfusion. Similar control graphies were obtained for those also.

Control x-rays showed complete fusions and sufficient stabilizations with our modified Cloward technique. Angulations and graft slippage anteriorly or posteriorly were detected in simple discectomy and standart techniques respectively, as shown in the table. 4 patients with graft slippage (one of them was operated at another hospital) were reoperated.

#### DISCUSSION:

Cervical fractures and disc pathologies were described even in ancient ages (2, 22, 29, 31, 37). Hippocrates also mentioned diagnosis and treatment of the cervical fractures (22).

The first scientific approach to the cervical fractures is the cervical tractions. The first credit might be given to Fabricus Hildanus who had developed his apparatus in early 16th century (22). After several apparatuses were developed, but Crutchfield is the most popular and it is widely used all over the world (8, 10, 13, 22, 38).

Many different operative techniques were offered since Paul Aegena who lived in İstanbul (Bisantion) in the 7th century. Better results were obtained after steroid therapy and external fixations (1, 4, 8, 13, 22).

There are a lot of controversies about the treatment of the cervical pathologies. These will be discussed

Table 1. The distrubition of the patients.

Operative Techniques	Indications		Complication
	Cervical Discs	Cervical Traumas	Type/Number
Modified Cloward	73 (55%)	4 (12%)	No complication
Vertebrectomy+ Interbody Fusion	12(9%)	17(47%)	(*) Graft Slippage/ 1(3%)
Cloward+ Interbody Fusion	41 (29%)	15 (41%)	(*)(") Graft Slippage/ 3(5%)
Simple Discectomy	8(6%)	0	Angulations/(25%)
TOTAL	134	36	6

(\*) Patients were reoperated,

(") One of them was first operated at the other hospital.



elsewhere (1, 6, 7, 9, 11, 12, 14, 16, 18, 19, 21, 23, 26, 28, 30, 32, 33, 35, 36). Anterior approach is more popular and more effective in the authors opinion. The authors believe that the main pathology could be removed easily and safely via the anterior approach. The most popular anterior approach is Cloward's technique (9). This operative technique has been widely used all over the world for the last 40 years. The authors also use the technique since 1972.

In spite of some criticism on this procedure very few modifications have been proposed. These modifications are limited on retractor blades and graft insertions (5-20, 27, 34).

This proposed modification is to change the basic graft shape and nontraumatic graft applications. Threaded surface of the graft does not only increase the surface resistance but also augments the stabilization. Application of threaded graft also makes compression effect on both vertebrae. So dislocations of the graft is minimalised and more stabile operative area can be achieved with this technique. Stable vertebrae facilitate the fusion formation.

Using a depth adjustable diestock receiving beds are threatened. Depth of burr hole could be measured and length of depth could be adjusted and fixed with a ring of the diestock. These facilities protect the spinal cord injuries.

The tip of the inserting device is screw fabpioher bo kpak it facilitates introduction of threatened graft. Graft insertion into the receiving bed by pushing gently and screwing not only protects the cord and nerve roots from trauma but also eliminates the fear of the surgeon during hammering. Advantages of this procedure can be summarised as superior resistance to pressure, greater fixation power, larger contact surface facilitating fusion formation, better stabilization, nontraumatic insertion, disappearing the stress of the surgeon during the graft insertion and needing no cervical brace in postoperative period.

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