

OUR COMPLICATIONS IN VERTEBRAL FRACTURES TREATED WITH ALICI SPINAL INSTRUMENTATION

C. GÖKÇE *

Ş. ŞENEL **

K. ÖZLÜ **

M. GÜLÇEK **

Between June 1990 and June 1994, seventy-eight vertebral fractures were treated with Alici Spinal Instrumentation in the 1st. Orthopaedics and Traumatology Clinic of Ankara Numune Hospital. Mean follow-up duration was 24 months.

In the follow-up, infection was found in 9 cases (11.5%), breakage of transpedicular screws in 5 cases (6.4%), dislodgment of transpedicular screws in 3 cases (3.8%). One patient died of anesthetic complications postoperatively.

Key Words: Thoracolumbar Fractures, Alici Spinal Instrumentation, Complications.

Since 1950's, the rapid development in medical technology has provided new opportunities in spinal surgery. New operative techniques and so many new instrumentation systems were began to be used. The increasing number of different surgical procedures brought its complications along.

Complications of spinal surgery can be titled as;

1. Peroperative complications

- Spinal cord, cauda equina, peripheral nerve injuries
- Dural tears and cerebrospinal fluid leaks
- Spinal fractures
- Pneumothorax, hemothorax
- Gastrointestinal system injuries
- Vascular injuries

2. Postoperative complications

a. Early complications

- Transfusion reactions
- Hepatitis
- Pulmonary problems
- Neurologic deterioratin
- Gastrointestinal tract problems
- Genitourinary tract problems
- Implant dislodgment
- Facet joint injuries
- Wound infections

One of other three cases, instrumentation with broken screws partially removed. Distal ends of broken screws had to be left within the vertebral body. All of those three patients accepted as having pseudoarthrosis, so the fusions renewed and the patients followed up in brace. In the follow-up LKA was found to be 12 degrees, loss of vertebral height was 22% and SI was 17 degrees.

During the follow-up of three patients, a failure of transpedicular screwing into pedicle was determined. In two of three, each one of transpedicular screws pairs were within intervertebral disc space. In other case, upper two screws was observed to be dislodged laterally. Of these patients the mean LKA was 23 degrees, mean loss of vertebral height was 50% and mean SI was 33 degrees preoperatively. In postoperative evaluation, these values were decreased to 7 degrees, 18% and 18 degrees respectively. In an avarage of twenty months follow-up, LKA values were increased to 10 degrees, loss of vertebral height to 23% and SI to 22 degrees. As no patient had any complaints, the fusions were accepted as being completed, so no additional procedures were needed.

DISCUSSION

When English literature was reviewed, infection rates after spinal surgery ranged from 0% to 12.9% (5, 6, 7, 9, 10, 11, 12, 13, 16, 17, 18, 19, 20). Our rate of infection was 11.5%. Which is close to upper limits given in literature. As known, there are also host related factors which increase the risk of infection: age, chronic malnutrition, morbid obesity, poorly controlled diabetes, steroid therapy, immunosuppression, the presence of remote infections (e.g. urinary tract, skin, respiratory tract), prolonged preoperative hospitalization (15).

b. Late complications

- Infection
- Implant breakage
- Pseudoarthrosis
- Progressive kyphosis
- Lordosis in fusion site
- Loss of correction
- Growth arrest
- Decreasing lumbar lordosis

* Co-Chief, 1st Ortop. and Traum. Clin. of Ankara Numune Hospital

** Resident, 1st Ortop. and Traum. Clin. of Ankara Numune Hospital

Table 1.

		LKA (degree)	Loss of vertebral height (percent)	SI (degree)
Infection	PREOP.	25	43	25
	POSTOP.	10	18	10
	FOLLOW-UP	18	34	18
Breakage of transpedicular screw	PREOP.	22	50	27
	POSTOP.	9	14	14
	FOLLOW-UP	12	22	17
Transpedicular screw dislodgment	PREOP.	23	50	3
	POSTOP.	7	18	18
	FOLLOW-UP	10	23	22

Spinal column, with its osseous structure and its close anatomical relation with spinal cord, peripheral nerves, sympathetic system, major vessels, lungs, heart and intraabdominal organs, faces us with major complications in the peroperative and postoperative period.

MATERIAL AND METHOD

Between June 1990 and June 1994, in the 1st Orthopaedics and Traumatology Clinic of Ankara Numune Hospital, seventy-eight thoracolumbar fractures were treated with Alici Spinal Instrumentation. With a mean follow-up time of twenty-four months, infection was found in nine cases (11.5%), breakage of transpedicular screws in five cases (6.4%) and dislodgment of transpedicular screws in three cases (3.8%). One patient died of cardiac problems due to anesthetic complications in early postoperative period.

Antibiotic prophylaxis with 2 grams of first generation cephalosporin was given intravenously to all patients just before the operation and forty-eight hours postoperatively. In spite of all measures, nine patients developed infection. In five of those infected patients, signs of infection were observed from the third to the eleventh day postoperatively. Although antibiotic treatment was appropriate to specimen culture and antibiogram and irrigation and debridement of wound were performed infection was not taken under control and implants had to be removed within five months.

In other four infected cases, because of infection with fistula formation, implants again had to be re-

moved averaging twenty-six months postoperatively. Since the fusion was complete in all, an additional procedure was not needed. One month after the removal of implants, all signs of infection was disappeared.

In all infected cases, preoperative average local kyphosis angle (LKA) was 25 degrees, loss of vertebral height was 43%, sagittal index (SI) was 25 degrees. In the postoperative evaluation, these values were decreased to 10 degrees of LKA, 18.5 of loss of vertebral height and 10 degrees

of SI. After a mean period of fifteen months, when the cases whose implants was removed reevaluated, 18 degrees of mean LKA, 34% of mean loss of vertebral height, 18 degrees of mean SI was found.

The breakage of transpedicular screw was determined in five cases. Of these patients, the mean values of LKA was 22 degrees, loss of vertebral height was 50% and SI was 27 degrees preoperatively. One of these five cases, in whom the breakage of screws were determined an average time of eleven months, denied a new operation because he had no complaints. In another case, instrumentation with broken screw was removed altogether. Since the fusion was observed to be completed, an additional intervention was not necessitated.

In our series, average age was twenty-eight which was not correlated with literature. However, time from injury to operation was twelve days that is a significant factor for development of infection. In addition, we believe the correction of operative room conditions will decrease the rate of infection in not only spinal surgery but also in all procedures (e.g., decreasing number of working staff, the use of laminar air flow, experience of surgical team and having optimal sterilization facilities).

One of five patient with broken screws had no clinical complaints. He didn't consent into a new operation. In the case who showed up with a broken screw after twenty two months postoperatively, the fusion was seen as completed during implant removal. The cause of breakage of the screw was bounded to im-

plant insufficiency. This screw was first transpedicular screw of Alici Spinal Instrumentation that was unthreaded proximally and deeply threaded distally. For these type of screws were biomechanically insufficient, new models had been developed. In other three patients, the breakage of screws were determined after an eight months of follow-up. Instruments were removed. Because of pseudoarthrosis the fusion was renewed. In our series, the rate of pseudoarthrosis was 3.8%. The rate of pseudoarthrosis in the literature ranges from 0% to 4% (1, 2, 3, 8, 14). Short segmental instrumentations were performed in all three patients. The anterior compression rates 50% and more has led us to a conclusion that this preference was not correct. We are of the opinion that surgery must include particularly anterior approach and support with long segmental posterior instrumentation.

In three patients whom transpedicular screws into pedicle had been incorrectly positioned, surgical techniques therefore were incorrect. Because during follow-ups, LKA was not decreased more than 10 degrees and the patients had no clinical symptoms, we didn't perform any additional operations and just observed. We believe that transpedicular screwing under image intensifier control intraoperatively is one of the factors affecting the rate of success.

As a result, as the surgical interventions increase in our country, the complication rates show accompanying increase. When such important operations are performed in certain centers, under developed operative room conditions and by experienced surgical teams, these rates will decline.

To suppress the rate of infection, preoperative hospitalization should not be long and prophylactic antibiotics preferably first generation of cephalosporines should be used.

The breakage of transpedicular screws were usually due to pseudoarthrosis. We believe that the rate of pseudoarthrosis could be decreased with correct surgical planning, technique and sufficient bone grafting to the fusion site.

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