

Abstract #278.docx

A FEASIBILITY OF MICROSCOPIC-ASSISTED FREE-HAND TECHNIQUE FOR PEDICLE SCREW INSERTION OF C7 VERTEBRA WITHOUT FLUOROSCOPY

Introduction/Aim

This study was aimed to introduce a surgical technique for a microscope-assisted pedicle screw (PS) insertion without fluoroscopy in the C7 vertebra and to determine its feasibility.

Materials and Methods

A total of 32 patients who underwent PS insertion in C7 were included. Preoperative and postoperative cervical radiographs and computed tomography (CT) were taken for all enrolled patients, with special attention paid to cortical breaches. The technique was carried out as the following steps: First, the ideal PS entry point was chosen at the three-dimensional simulation software based on the preoperative CT images. Second, the convergent angle distance (CVAD) was determined preoperatively at the axial CT image, which was defined as a distance between the tip of the C7 spinous process (TC7SP) and a passing line through the axial center of the pedicle. Finally, the cranial-caudal angle distance (CCAD) was also determined at the preoperative sagittal CT images. During surgery, customized guide-bar which of the length is CVAD placed upwardly as long as CCAD from the TC7SP. The guide-bar tip to the ideal PS entry point is the real trajectory.

Results

Out of 64 PS screws, cortical breaches were observed on postoperative CT images for 3 screws (4.6%), including two screws in the right PS and one screw in the left PS. These three screws was breached lateral wall of pedicle. Postoperative neurologic deterioration was not observed in the three patients with a cortical breach.

Discussion

Careful positioning of the screw is paramount; therefore, almost every surgeon carries out PS placement under fluoroscopic guidance. Unfortunately, fluoroscopic guidance during PS placement in C7 has several drawbacks: the anatomic structures of C7 can be concealed by shadowing of the shoulder, which make the checked fluoroscopic image to be bootlessly.

Conclusion

The current study demonstrated that our technique led to successfully place the PS in the C7 under microscope without aiding fluoroscopy, with relatively lower rate of cortical breaching.