

Efficacy Of Intraoperative Cone Beam CT In Spinal Surgery

Takashi Yagi¹ Hiroaki Murayama¹, Koji Hashimoto¹, Nobuo Senbokuya¹, Hideyuki Yoshioka¹, Kazuya Kanemaru¹, Hiroyuki Kinouchi¹

¹Neurosurgery/ University Of Yamanashi/ Japan

Purpose

Utilization of intraoperative cone beam CT(CBCT) in spinal surgery is useful in many points such as precise screw placement. We are using portable CBCT (O-ARM) from 2014 and Robotic DSA (Artis Zeego) from 2016 as surgical support. In this study, we examine its usefulness and problems.

Materials and Methods

In recent 3 years, 21 patients out of 178 cases with spine disorders underwent surgeries using intraoperative CBCT. The number and timing of imaging, the time required for imaging, and the accuracy of screw placement in fusion surgery cases were examined. In cases with ligament ossification or foraminal stenosis, the influence of intraoperative CT imaging on surgical procedures was examined.

Results

CBCT was used in the following cases: Lumbar fusion (9), Cervical fusion (2), Cervical foraminotomy (3), decompression for ligament ossification (4), percutaneous endoscopic lumbar discectomy (2), and removal of schwannoma (1). CBCT was performed 1 to 3 times, and the interruption time by imaging was 12 minutes by O-ARM and 9.8 minutes by Zeego respectively. In 11 fusion surgery, 55 screws placed with real-time navigation and there was no screw perforation. In 6 cases, additional procedures such as removal of residual lesion and replacement of screws after imaging. The convenience of the robotic DSA was superior to the O-ARM in surgical procedures in which intraoperative lateral fluoroscopy is important such as anterior foraminotomy or PELD.

Conclusion

Intraoperative use of CBCT in spinal surgery is useful technique for improving safety and reliability of surgical procedures.