DESIGN, DEVELOPMENT AND APPLICATION OF
COMPUTER ASSISTED PEDICLE SCREW FIXATION

Abstract

The Design, Development and Application of Computer Assisted Pedicle Screw fixation by a novel method for accurate placement of pedicle screws is proposed. The location and orientation of the pedicle screws are clinically important in pedicle screw fixation. In the proposed technique, the point of insertion is determined using the image slices of diagnostic CT. The orientation of the pedicle screw is determined by processing the video streams captured online during the surgical process using two digital cameras. Mathematical morphology based techniques are employed for screw segmentation and Hough Transform for angle determination. This is a very less expensive system with a personal computer and two digital cameras, and can be assembled on demand successfully. The system has proved to have clinical precision required for spine surgery and extremely useful in medical education field for surgery training.

Key words: Pedicle screw fixation, computer assisted spine surgery, mathematical morphology