iPod Touch-Assisted Instrumentation of the Spine: A Technical Report

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BACKGROUND: Instrumentation of the spine depends on choosing the correct insertion angles to implant screws. Although modern image guidance facilitates precise instrumentation of the spine, the equipment is costly and availability is limited. Although most surgeons use lateral fluoroscopy to guide instrumentation in the sagittal plane, the lateromedial angulation is often chosen by estimation. To overcome the associated uncertainty, iPod touch–based applications for measuring angles can be used to assist with screw implantation. OBJECTIVE: To evaluate the use of the iPod touch to adjust instruments to the optimal axial insertion angle for placement of pedicle screws in the lumbar spine. METHODS: Twenty lumbar pedicle screws in 5 consecutive patients were implanted using the iPod touch. The lateromedial angulation was measured on preoperative images and reproduced in the operative field with the iPod touch. The instruments to implant the screws were aligned with the side of the iPod for screw insertion. Actual screw angles were remeasured on postoperative imaging. We collected demographic, clinical, and operative data for each patient. RESULTS: In 16 of 20 screws, the accuracy of implantation was within 3 degrees of the ideal trajectory. The 4 screws with an angle mismatch of 7 to 13 degrees were all implanted at the caudal end of the exposure, where maintaining the planned angulation was impeded by strong muscles pushing medially. CONCLUSION: iPod touch–assisted instrumentation of the spine is a very simple technique, which, in combination with a lateral fluoroscopy, may guide placement of pedicle screws in the lumbar spine.
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