

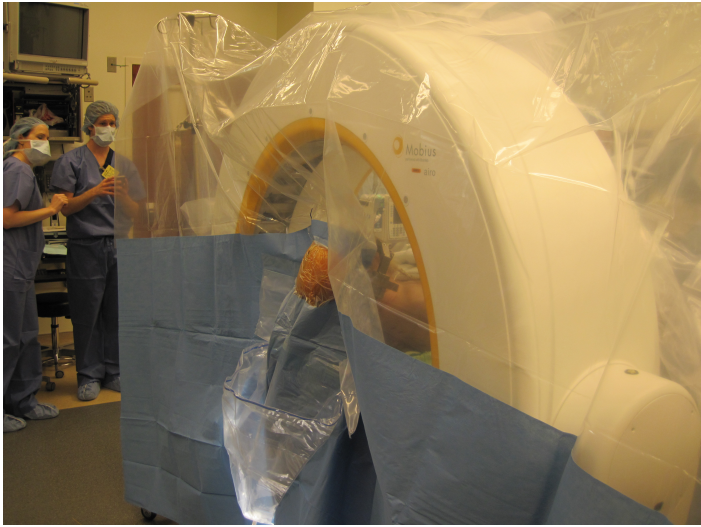
Introduction

Stereotactic frame registration is often carried out using a standard CT scan obtained in the radiology department. With the availability of better intraoperative CT scanners the opportunity for streamlining the workflow for these cases now exists. We sought to determine if intraoeprative CT was capable of performing scans adequate for frame registration and how the target coordinates provided by this registration compared with those obtained from a standard CT scanner

Methods

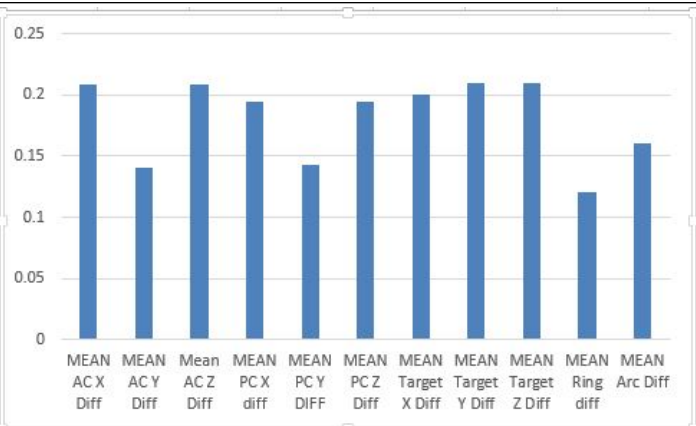
Ten consecutive patients undergoing DBS surgery underwent standard CT scans to register the stereotactic frame for DBS surgery. They also underwent low dose scans with the intraoperative scanner. These scans were uploaded to iPlan Stereotaxy 3.0 software. The frames were registered from these scans and the scans were merged with preoperative MRI. Commissural coordinates were obtained, as well as frame settings (x, y, z, arc and ring angles).

View of patient draped for surgery in intraoperative CT scanner

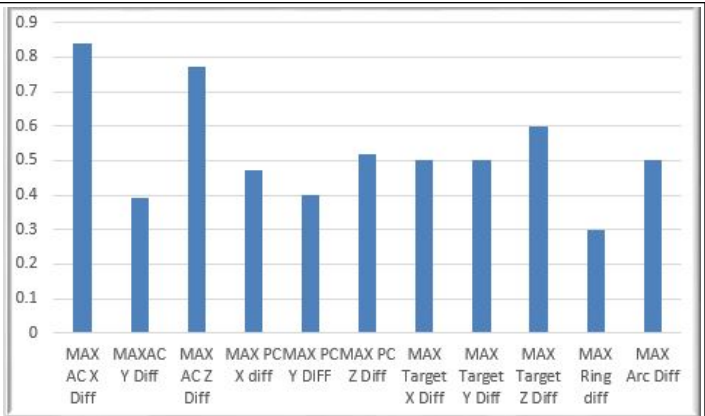


Results

The frame was successfully registered in all cases, although more adjustment of window and level were required for the intraoperative CT scans. All coordinates compared favorably. No pair of coordinates differed by more than 0.84 between scan registrations. The mean difference across all coordinates was 0.19. The largest mean difference between coordinate pairs was 0.21 for both the target Y and Z coordinates. There was no significant difference in the variation between scans for the AC, PC, or target.



Mean differences between frame coordinates obtained with the standard CT scanner and the intraoperative CT scanner



Maximum differences between frame coordinates obtained with the standard CT scanner and the intraoperative CT scanner

Conclusions

The intraoperative CT scanner can capably register the Leksell frame and provide coordinates comparable to those obtained with a standard CT scan. Abandoning the trip to radiology may save time and effort as part of stereotactic case workflow. This may also reduce total patient radiation exposure by using the intraoperative CT low dose sinus scan mode.

Learning Objectives

By the conclusion of this session, participants should be able to:

1. understand the use of intraoperative CT for frame registration
2. understand the impact of intraoperative CT on stereotactic case workflow