TITLE

Single surgeon DBS surgeries can also be optimised to two a day.

RUNNING TITLE

Two single surgeon DBS surgeries a day.

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We read with interest Zrinzo et al’s audit of ‘two surgeons, one list’ parallel working enabling two DBS surgeries to be performed in one working day [1]. We have been doing two DBS surgeries in a working day for over half a decade, in series as a single surgeon, often unassisted without CT or MRI in theatre. In 2023, 34 cases were performed in one hospital, of which 22 were two cases in the same day. Our workflow (with mean times) is pre-operative outpatient MRI and trajectory planning before day of surgery; general anaesthesia (17 min); stereotactic base-ring and localiser placement then transfer to CT (19 min); transfer to theatre and urinary catheter insertion by anaesthetist while stereotactic coordinates are obtained from CT fusion to MRI plan (26 min); brain electrode insertion (44 min); transfer to CT in frame for verification of electrode position (17 min); transfer to theatre for frame removal and pulse generator implantation (31 min). Mean time from induction of anaesthesia to extubation was 181 min (sd 32 min). The workflow was modified a few times to implant the IPG while still in the frame before the verification CT due to radiographers advising delay of half an hour or more for CT access. A typical operating list would commence with WHO briefing at 9am, mean knife to skin 9:59am for the first case and mean skin closure at 4:40pm for the second case.

The authors are a long-established high-volume DBS centre with a reputation for publishing audits of outstanding clinical outcomes from an MRI guided, MRI verified asleep surgical approach emphasising the superiority of direct target visualisation by MRI. We are pleased to see their recent acknowledgment of CT verification as having benefits in more accurately determining electrode depth and reducing time being scanned. We agree that minimising air ingress and thus brain shift during surgery optimises accuracy and contend that this is augmented by a 3mm twistdrill craniostomy and quick operation. With constant improvements in modern DBS planning software, their workflow could be sped up further by a ‘CT fusion to prior MRI’ guided approach. We do not know that their fiducial registration of framed CT to framed MRI is necessarily more accurate than our head registration of framed CT to prior MRI but this would be worthy of further investigation. We have also found that server-based planning solutions expedite surgeries as planning and checking can be done ‘on the go’ from a laptop or any hospital computer whether in theatre, scanner or at home.

Our similar approach to the authors in performing quick, asleep DBS without microelectrode recording has been driven by a belief that minimising operative (and general anaesthetic) time minimises risks of infection, thromboembolic events thus morbidity and optimises recovery thus outcome, particularly for more frail Parkinson’s patients. Ultimately DBS centres should adapt solutions to local infrastructure availability or its disruption. We perform DBS in three to four hospitals that currently lack MRI-compatible stereotactic frames let alone intra-operative MRI or cranial robots, but whether such technologies are superior for bilateral DBS alone is debatable. We commend the authors for having adapted their workflow to increase efficiency, even with ample technological resource, and also reduced their public sector patient waiting times for DBS. It is heartening to see service improvements made not just to improve patient care but also for patient access to care.

DBS is a complex operation. Few other surgeries have so many steps before knife to skin. Zrinzo et al show how productivity can be doubled with the complexity juggled by roleplay between two senior surgeons. Here we describe alternative nuances to surgical workflow that we hope can also help solo functional neurosurgeons to increase their speed and productivity.

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Conflict of Interest

The authors have no conflicts of interest to declare.

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Author Contributions

EP conceived and wrote the letter and performed the operations. TS collated and analyzed the data. AT reviewed the data and anaesthetized most cases.

References

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