Hubly Surgical

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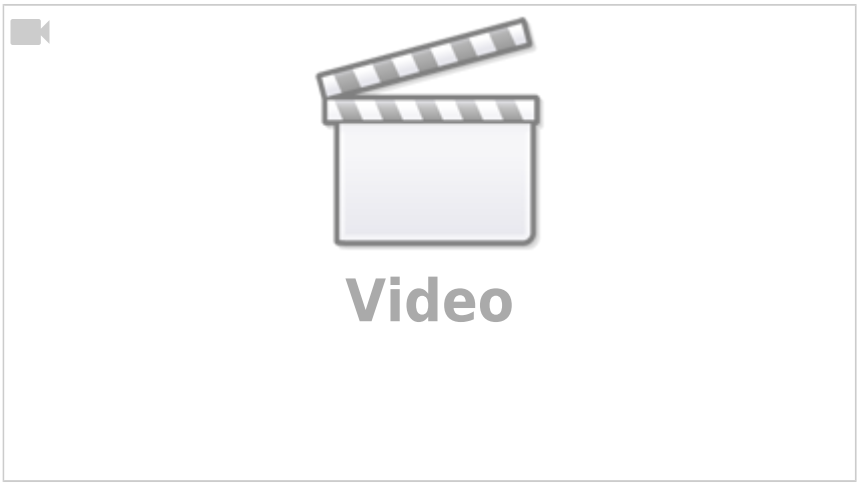

The manual twist drill used for intracranial access represents an opportunity for potential improvement in efficiency, safety, and ease of use. A new generation of portable electrical drills with smart autostop mechanisms, such as the Hubly cranial drill (Hubly Surgical; Lisle, IL), aim to address these opportunities for improvement.

Two patients received EVDs using the portable electrical autostop drill (PEAD): A 54-year-old woman who suffered a postoperative hemorrhage and a 59-year-old woman who presented with early hydrocephalus secondary to hypertensive subarachnoid hemorrhage (SAH). Between both patients, a total of 9 and 2 access attempts were necessary to breach the inner table and visual dura. Access times in both cases, from skin incision to dural puncture, were less than 5 min. There were no apparent complications with the use of the PEAD in either case, and there was excellent placement of the EVD at the foramen of Monroe in both cases.

Oak et al. demonstrate the first successful use of a portable electrical drill with smart autostop in humans. The PEAD has potential to reduce procedure time and human error. Further development of the smart autostop drill may allow for more consistent and safer EVD placement [1)].

A cadaveric study was conducted using both drills to perform several burr holes in the fronto-temporo-parietal region of the skull. An evaluation was performed on the number of dura plunges, and complete burr hole success rates were compared.

A total of 174 craniotomies using the HD and 36 burr holes using the ST perforator were performed. Despite significantly exceeding intended drill bit tolerance by multiple uses of a single-use disposable HD, autostop engaged in 100% of the 174 craniotomies and before violating dura in 99.4% of the 174 craniotomies, with the single dura penetration occurring on craniotomy no. 128 after the single-use drill bit had significantly dulled beyond its single-use tolerance. Autostop engaged before dura penetration for 100% of the 36 burr holes drilled with the ST perforator (P = .610). All the perforations were complete using the HD after resuming drilling. An autostop mechanism in a cranial drill is not commonly available for portable bedside perforators. In the operating room, most use a mechanical method to stop the rotation after losing bone resistance. This new drill uses an electrical mechanism (smart autostop) to stop drilling, making it a single-use cranial drill with advanced

features for safety and efficiency at the bedside.

There was no difference in the safety and efficacy of the new cordless electric drill with smart autostop when performing craniotomies compared with a traditional well-established electric cranial perforator with mechanical autostop on a cadaveric model [2)]

1)
Oak A, Dardick J, Rusheen A, Materi J, Weingart J, Gonzalez LF, Anderson WS, Mukherjee D. First-in-human experience of a portable electrical drill with smart autostop for bedside external ventricular drain placement. J Clin Neurosci. 2024 Nov 27;131:110941. doi: 10.1016/j.jocn.2024.110941. Epub ahead of print. PMID: 39608055.
2)
Assumpcao de Monaco B, Benjamin CG, Doomi A, Taylor R, Stringfellow CE, Benveniste RJ, Jagid JR, Graciolli Cordeiro J. Safety Analysis of a New Portable Electrical Drill With a Smart Autostop Mechanism for Bedside Cranial Procedures. Oper Neurosurg (Hagerstown). 2023 Oct 1;25(4):311-314. doi: 10.1227/ons.0000000000000804. Epub 2023 Aug 4. PMID: 37543731; PMCID: PMC10468110.