VarioGuide

BrainLAB® VarioGuide- Frameless neuronavigation system.

Case series

Ladisich et al. retrospectively identified all consecutive adult DRE patients, who underwent VG-neuronavigation DE implantations, between March 2013 and April 2019. Clinical data were extracted from the electronic patient charts. An interdisciplinary team agreed upon all treatment decisions. We performed trajectory planning with iPlan® Cranial software and DE implantations with the VG system. Each electrode's accuracy was assessed at the entry (EP), the centre (CP) and the target point (TP). We conducted correlation analyses to identify factors associated with accuracy.

Results: The study population comprised 17 patients (10 women) with a median age of 32.0 years (range 21.0-54.0). In total, 220 DEs (median length 49.3 mm, range 25.1-93.8) were implanted in 21 SEEG procedures (range 3-16 DEs/surgery). Adequate signals for postoperative SEEG were detected for all but one implanted DEs (99.5%); in 15/17 (88.2%) patients, the EZ was identified and 8/17 (47.1%) eventually underwent focus resection. The mean deviations were 3.2 ± 2.4 mm for EP, 3.0 ± 2.2 mm for CP and 2.7 ± 2.0 mm for TP. One patient suffered from postoperative SEEG-associated morbidity (i.e. conservatively treated delayed bacterial meningitis). No mortality or new neurological deficits were recorded.

Conclusions: The accuracy of VG-SEEG proved sufficient to identify EZ in DRE patients and associated with a good risk-profile. It is a viable and safe alternative to frame-based or robotic systems [1)].

2015

Avecillas-Chasin et al present the use of the VarioGuide system (Brainlab, Iberica) for intraventricular endoscopic biopsy in children with small ventricles. Nine consecutive pediatric patients with intraventricular lesions and small ventricular size were included. All patients had lesions in the anterior part of the third ventricle with a median frontal and occipital horn ratio (FOR) of 0.33. Four patients presented with growth failure, four patients with visual disturbances, and one patient with seizures. The VarioGuide system consists of an ergonomic arm with three joints for gross adjustment. The three rotational joints on the distal side of the system are adjusted according to the angles of the planned trajectory. The endoscope is adjusted to the distal side of the VarioGuide and inserted through the ring, previously set for the diameter of the endoscope and for the planned trajectory. The accuracy of the trajectory and correct ventricular cannulation are confirmed under endoscopic guidance. The biopsy is then carried out according to the standard technique. In all cases the biopsy sample provided the definitive diagnosis. Four patients were diagnosed with germinomas, one with hamartoma, two with hypothalamic astrocytoma and two with craniopharyngioma. The use of the VarioGuide system for intraventricular endoscopic biopsy is a new procedure highly recommended for pediatric patients with small ventricle size. This technique may help minimize the risk of unnecessary brain damage during the entrance to small ventricles [2)].

2013

15 men and 5 women with various intracerebral lesions were biopsied. Their average age was 62 years (range, 41-83 years). Preoperative planning was performed using computed tomography (CT) or magnetic resonance imaging (MRI) data provided by a radiological picture archiving and communication system (PACS) sent to the planning station. Planning was based on either MRI or CT in 14 and 4 cases, respectively, and a combination of both in 2 cases.

The lesions had a mean maximal diameter of 42.97 mm (range, 5.8-109.8 mm). 19 lesions were supratentorial, 1 of those intraventricular, and 1 lesion was infratentorial, within the cerebellar peduncle and brainstem. During surgery, the samples were sent to neuropathological examination, and the procedure was completed after confirmation that pathological tissue was obtained. In 18 of 20 cases, definitive pathological tissue was harvested. Histopathology confirmed 8 glioblastomas, 1 oligoastrocytoma, 4 anaplastic astrocytomas, 1 astrocytoma, and 2 primary central nervous system lymphomas, as well as 1 encephalitis and 1 necrotic tissue of unknown origin. In 3 cases, including the case of necrotic tissue, there was no final diagnosis possible. Referencing the BrainLAB® navigation system and software-wizard guided sterile adjustment of the VarioGuide arm over the entry point took 5 to 10 minutes. The mean operation time was 49 minutes (range, 24-69 minutes) including the time until first neuropathological examination was completed. No adverse events occurred during or after the operation [3].

1)
Ladisich B, Machegger L, Romagna A, Krainz H, Steinbacher J, Leitinger M, Kalss G, Thon N, Trinka E, Winkler PA, Schwartz C. VarioGuide® frameless neuronavigation-guided stereoelectroencephalography in adult epilepsy patients: technique, accuracy and clinical experience. Acta Neurochir (Wien). 2021 Feb 13. doi: 10.1007/s00701-021-04755-w. Epub ahead of print. PMID: 33580853.

2)
Avecillas-Chasin JM, Budke M, Villarejo F. Neuroendoscopic Intraventricular Biopsy in Children with Small Ventricles using Frameless Varioguide® System. World Neurosurg. 2015 Dec 23. pii: S1878-8750(15)01700-3. doi: 10.1016/j.wneu.2015.12.022. [Epub ahead of print] PubMed PMID: 26723291.

3)
Buchalla R, Hopf-Jensen S, Rubarth O, Börm W. Frameless navigated biopsy with the BrainLAB® VarioGuide system: a technical note. J Neurol Surg A Cent Eur Neurosurg. 2013 Sep;74(5):321-4. doi: 10.1055/s-0032-1315790. Epub 2012 Jul 7. PubMed PMID: 22773440.