Navigated drilling with

adeor Velocity Alpha® High Speed Drill System

and Brainlab Cranial Navigation (Case Report)

Introduction

This case report describes the clinical use of the adeor Velocity Alpha® high speed drill system in combination with Brainlab Cranial Navigation during the resection of a clinoidal meningioma involving the optic nerve. The adeor drill system was used together with Brainlab Cranial Navigation and Brainlab Instrument Adapter Clamp Starlink to support navigated drilling.

Equipment and software

adeor MEDICAL

Velocity Alpha® High Speed Drill System:

- VAC220 Control Unit
- VAM High Speed Motor
- VMN-A2 Straight Attachment
- DB42 Diamond Ball Universal Cutter (4.2 mm)

BRAINLAB

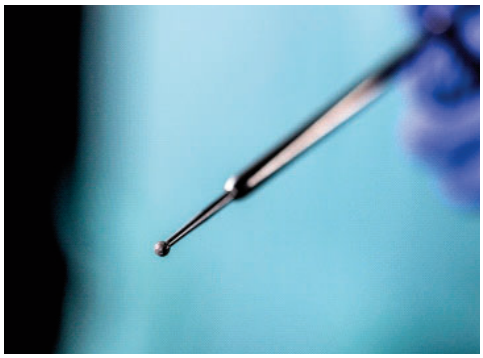
- Cranial Navigation
- Instrument Adapter Clamp Starlink Softgrip (Sizes L and XL)
- Instrument Tracking Array Starlink (Size L)
- Instrument Calibration Matrix

Clinical workflow

1. Patient registration using Brainlab Cranial Navigation and Surface Matching Registration.
2. Verification of navigation accuracy prior to use on at least three anatomical landmarks.
3. Attachment of the Brainlab Instrument Adapter Clamp Starlink to the adeor handpiece.

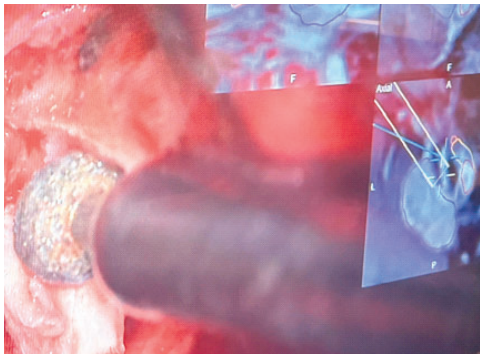
4. Mounting of the Brainlab Instrument Tracking Array Starlink to the Instrument Adapter Clamp.

5. Mounting of the adeor burr.



6. Calibration of the adeor handpiece incl. burr using the 6 mm calibration receptacle of the Brainlab Instrument Calibration Matrix.
7. Accuracy verification of the instrument tip and axis using the Instrument Calibration Matrix.

8. Navigation-assisted drilling during tumor exposure and resection to enhance precision by providing real-time drill tip and depth control.



Key considerations

The combination of adeor Velocity Alpha® high speed drill system in combination with Brainlab Cranial Navigation and Brainlab instrument calibration enables navigated drilling for bony removal and orientation during the skull base approach. The navigated workflow supported surgical efficiency and accuracy.

- To maintain accurate navigation, keep the burr position within the handpiece unchanged after registration. Any adjustment requires recalibration.
- For reliable navigation, an uninterrupted line of sight between the tracking unit and the camera must be ensured.
- The navigated instrument is displayed with a diameter of 6 mm due to the calibration setup, while the actual burr diameter is 4.2 mm.
- Using the microscope, a balance between instrument visibility, ergonomics and navigation accuracy must be maintained. Increasing the distance between the tracking unit and the instrument tip may improve visibility within the surgical field, while potentially reducing navigation accuracy. Positioning the tracking unit closer to the instrument tip may improve navigation accuracy, although visibility and access within the surgical field may be reduced.

The result: Successful integration of navigated drilling in skull base tumor resection

- In this case report, the Velocity Alpha® High-Speed Drill System was successfully integrated with Brainlab Cranial Navigation for navigated skull base drilling during clinoidal meningioma resection via the Brainlab third-party instrument calibration.
- Navigated drilling enabled real-time drill tip visualization to support orientation and controlled bone removal during skull base drilling.

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