Background
Decompressive hinge craniotomy (DHC) is an emerging alternative technique to decompressive hemicraniectomy (DC) in patients with refractory intracranial hypertension. DHC allows the bone plate to displace, thereby gradually increasing intracranial volume to comply with cerebral edema and rising ICP. Follow-up cranioplasty is not necessary.

A technique for DHC was developed and introduced in 2020 in Copenhagen.

Materials and methods
A technical guide for surgery and subsequent follow-up was introduced. Patients with refractory intracranial hypertension or severe midline shift on CT were surgical candidates. Whether to perform DHC or DC was decided by the surgeon per-operatively.

Patients all had pre- and post-operative CT-scans. ICP was monitored post-operatively until no longer necessary. A local neuro-rehabilitative unit followed up patients. All patients were retrospectively reviewed.

Results
From April 2020 to August 2023 a total of 20 patients have been operated with DHC in Copenhagen. Median age was 52.4 years (39-69 years). The indication was TBI in 5 cases (25%), unilateral ischemic stroke in 12 cases (60%), spontaneous ICH in 1 case (5%) and SAH complicated with unilateral MCA-infarction in 2 cases (10%). Median pre-operative GCS was 7.6 (3-13) and only 3 patients (15%) had verified anisocoria before surgery. 5 patients had ICP-monitoring before surgery and had median pre-operative ICP of 28.6 mmhg (18-40 mmhg). Pre-operative CT-scan showed a median midline shift of 10.5 mm (0-18 mm). The timing of the decompressive surgery was primary in 16 cases (80%) and secondary in 4 cases (20%). A right-sided decompression was performed in 14 cases (70%) and left-sided in 6 cases (30%). Average duration of surgery was 95 minutes (60-127 minutes). In 1 case the patient developed a hemorrhagic transformation of ischaemic stroke during the hours following surgery. A subsequent acute DC was performed due to failure to control ICP (5%). The remaining patients had ICP-control following DHC (95%). 2 patients had direct surgical complications, 1 patient with bone plate infection, which required later stage revision with bone plate removal and subsequent cranioplasty, 1 patient had superficial wound infection requiring wound revision. 1 patient was treated with a temporary external ventricular drain due to hydrocephalus 5 days following DHC. No follow-up cranioplasty or other later stage neurosurgical operation (ie. ventriculo-peritoneal shunt) was needed in 16 patients (2 had bone plate removal, 2 patients were lost to follow-up). Mortality rate within 30 days were 30% (6 patients), 2 patients were lost to follow-up. Median GOS-E score was attained in 17 patients (85%) and was 2.8 (range 1-7).

Conclusion
DHC appears to be effective in achieving ICP-control in majority of cases with refractory intracranial hypertension. Rates of complications and adverse events were low and DHC spared the patients for follow-up cranioplasty.