outcome was treatment failure, defined as: initial failure of aneurysm treatment, intracranial hemorrhage or residual aneurysm on one year imaging. Secondary outcomes included neurological deficits following treatment, hospitalization >5 days, overall morbidity and mortality and angiographic results at one year. *Results:* 136 patients were enrolled from 2010 through 2016 and 134 patients were treated. The one-year primary outcome, available for 104 patients, was reached in 5/48 (10.4% (4.5%-22.2%)) patients allocated surgical clipping, and 10/56 (17.9% (10.0%-29.8%)) patients allocated endovascular coiling (OR: 0.54 (0.13, 1.90), P=0.40). Morbidity and mortality (mRS>2) at one year occurred in 2/48 (4.2% (1.2%-14.0%)) and 2/56 (3.6% (1.0%-12.1%)) patients allocated clipping and coiling respectively. New neurological deficits (15/65 vs 6/69; OR: 3.12 (1.05, 10.57), P=0.031), and hospitalizations beyond 5 days (30/65 vs 6/69; OR: 8.85 (3.22,28.59), P=0.0001) were more frequent after clipping. *Conclusions:* Surgical clipping led to greater initial treatment-related morbidity than endovascular coiling. At one year, the superior efficacy of clipping remains unproven and in need of randomized evidence.

C.04

Dynamic MRI in the evaluation of the craniocervical junction of pediatric down syndrome patients

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Background: Down syndrome is the most common inherited disorder. Some patients develop craniocervical instability. Existing screening guidelines were developed prior to direct imaging of the neuraxis. We present parameters for potential instability using dynamic MRI of the craniocervical junction. *Methods:* A retrospective review from 2001 – 2015 was carried out. Patients were symptomatic if they had myelopathy or signal changes at the craniocervical junction. Radiographic measurements were taken. Data analysis was performed with SPSS. *Results:* 36 patients were included. Symptomatic patients had smaller CCD (9.4 mm vs 13.8 mm; p = 0.003) and greater ADI (4.4mm vs 3.0 mm; p = 0.01) on resting MRI . During dynamic imaging, symptomatic patients had greater changes in CCD (5.2 vs 2.7 mm; p <0.001) and ADI (2.8 vs 1.3 mm; p = 0.04). These patients were also more likely to have a bony anomaly (0.5 vs 0.13; p = 0.03). *Conclusions:* This study identifies parameters that can be used to distinguish unstable patients. A CCD of less than 5 mm or ADI greater than 4.4 mm on static MRI; change greater than 3mm in ADI or 5mm on CCD during dynamic MRI; or any bony abnormality warrants further investigation. Asymptomatic patients should be followed although most do not progress.

C.05

Is neurosurgical resident training safe?

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Background: With the emergence of competency-based residency education (CBME) in Europe and North America, supervised operative experience is essential for residents to demonstrate competency in requisite neurosurgical procedures prior to board certification. This study explores the implications of such operative exposure to patient safety. *Methods:* Using a pro- and retrospectively maintained databank at two Swiss teaching hospitals, we compared complications, revision surgery rates, and outcome of consecutive patients undergoing lumbar microdiscectomy (n=102), lumbar decompression (n=471), anterior cervical discectomy and fusion (n=281), cranioplasty (n=240), shunt implantation (n=200), and epidural steroid injections (n=354) by a supervised resident versus a board-certified faculty neurosurgeon as primary surgeon using logistic regression. *Results:* Intra- (OR 0.68, 95%CI 0.33–1.41, p=0.305) and postoperative complications (OR 1.14, 95%CI 0.78–1.65, p=0.49), revision surgeries (OR 1.23, 95%CI 0.78–1.93, p=0.36), operating time (p=0.87), blood loss (p=0.57) and the likelihood to be considered treatment responder (OR 0.91, 95%CI 0.65–1.28, p=0.62) was similar for both groups. Specifics of European and Canadian neurosurgery training are compared and discussed. *Conclusions:* Hands-on surgical education within the framework of a structured residency-training program is safe in cervical and lumbar spine surgery and for standard cranial procedures. The summarized results in conjunction with the literature suggest that CBME in Europe and Northern America would not compromise patient safety.

C.06

Retraction of scientific publications in neurosurgery

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Background: Despite increasing awareness of scientific fraud, no attempt has been made to assess its prevalence in neurosurgery. The aim of our review was to assess the chronological trend and reasons for the retraction of neurosurgical publications. *Methods:* We searched the EMBASE and MEDLINE databases using a comprehensive search strategy for retracted articles from January 1995 to December 2016. Archives of retracted articles on www.retractionwatch.com and the independent websites of neurosurgical journals were also searched. Data including the journal name and its impact factor, reason for retraction, country of origin, and citations were extracted. *Results:* A total of 72 studies were included for data extraction. Journal impact factor ranged from 0.24 to 14.4. Most studies(76%) were retracted within the last 5 years. The most common reason for retraction was because of a duplicated publication found elsewhere(25%), followed closely by plagiarism(21%), or falsifying data(17%). Other reasons included scientific errors/mistakes, author misattribution, and fraudulent peer review. Articles originated from several different countries and some were widely cited. *Conclusions:* Retractions of neurosurgical publications are increasing globally, mostly due to issues of academic integrity. Implementation of more transparent data sharing and screening as well as additional education for new researchers may help mitigate these issues moving forward.