Unsupervised clustering methods were used to define two distinct molecular subgroups of VS which were explored using computational techniques including bulk deconvolution analysis, gene pathway enrichment analysis, and drug repurposing analysis. Methylation data from two other cohorts were used to validate our findings. Results: A total of 75 tumours were analyzed. Consensus clustering and similarity network fusion defined two subgroups ("immunogenic" and "proliferative") with significant differences in immune, stroma, and tumour cell abundance. Gene network analysis and computational drug repurposing found critical differences in targets of immune checkpoint inhibition PD-1 and CTLA-4, the MEK pathway, and the epithelial-to-mesenchymal transition program with associated candidate drug targets, suggesting a need for subgroup-specific treatment/trial design in the future. Conclusions: We leverage computational tools with multi-omic molecular data to define two robust subgroups of vestibular schwannoma with differences in microenvironment and therapeutic vulnerabilities.

F.3

Comprehensive multiplatform analysis of CDKN2A alterations in meningiomas

JZ Wang (Toronto) V Patil (Toronto) J Liu (Toronto) H Dogan (Heidelberg) G Tabatabai (Tübingen) F Behling (Tübingen) E Hoffman (Tübingen) S Bunda (Toronto) R Yakubov (Toronto) R Kaloti (Toronto) S Brandner (London) A Gao (Toronto) A Cohen-Gadol (Bloomington) J Barnholtz-Sloan (Gaithersburg) M Skardelly (Tübingen) M Tatagiba (Tübingen) D Raleigh (San Francisco) F Sahm (Heidelberg) PC Boutros (Los Angeles) K Aldape (Bethesda) F Nassiri (Toronto) G Zadeh (Toronto)*

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Background: In meningiomas, CDKN2A/B deletions are associated with poor outcomes but are rare in most cohorts (1-5%). Large molecular datasets are therefore required to explore these deletions and their relationship to other prognostic CDKN2A alterations. Methods: We utilized multidimensional molecular data of 560 meningiomas from 5 independent cohorts to comprehensively interrogate the spectrum of CDKN2A alterations through DNA methylation, copy number variation, transcriptomics, and proteomics using an integrated molecular approach. Results: Meningiomas with either CDKN2A/B deletions (partial or homozygous loss) or an intact CDKN2A gene locus but elevated mRNA expression ($CDKN2A^{high}$) both had poor clinical outcomes. Increased CDKN2A mRNA expression was a poor prognostic factor independent of CDKN2A deletion. CDKN2A expression and p16 protein increased with tumor grade and more aggressive molecular and methylation groups. $CDKN2A^{high}$ meningiomas and meningiomas with CDKN2A deletions were enriched for similar cell cycling pathways dysregulated at different checkpoints. p16 immunohistochemistry was unreliable in differentiating between meningiomas with and without CDKN2A deletions, but increased positivity was associated with increased mRNA expression. $CDKN2A^{high}$ meningiomas were associated with gene hypermethylation, Rb-deficiency, and lack of response to CDK inhibition. Conclusions: These findings support the role of CDKN2A mRNA expression as a biomarker of clinically aggressive meningiomas with potential therapeutic implications.

F.4

Relationship between poor postoperative pain control and surgical outcomes after elective spine surgery

R Far (Calgary) TT Sajobi (Calgary) J Riva-Cambrin (Calgary) S Casha (Calgary) MM Yang (Calgary)*

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Background: Inadequate pain control after spine surgery is common, but its impact on long-term surgical outcomes has not been studied. Accordingly, this study aimed to investigate the relationship between poor postoperative pain control and surgical outcomes. Methods: Consecutive adult patients undergoing elective spine surgery were enrolled. Poor surgical outcome was defined as failure to achieve a minimal clinically important difference (MCID) of 30% improvement on the Oswestry Disability Index or Neck Disability Index at follow-up (3-months, 1-year, 2-years). Poor pain control was defined as a mean numeric rating scale score of >4 within 24-hours postoperatively. Univariable analyses followed by multivariable random-effects models were used, after adjusting for known risk factors that impact surgical outcomes. Results: 42.8% of 1305 patients failed to achieve MCID at follow-up. 56.9% had poor postoperative pain control. Poor pain control was independently associated with failure to achieve MCID (OR 2.15 [95%CI=1.42-3.25], $p<0.001$), after adjusting for age ($p=0.15$), sex ($p=0.59$), PHQ-9 score ($p=0.030$), ASA physical status >2 ($p<0.001$), ≥3 motion segment surgery ($p=0.003$), revision surgery ($p=0.032$), and follow-up time ($p<0.001$). Conclusions: Poor pain control 24-hours after elective spine surgery was an independent risk factor for poor surgical outcome. Perioperative strategies to improve pain control may lead to improved outcomes.

F.5

Spinal column and spinal cord injuries secondary to mountain biking accidents: a 15-year review at a provincial spine referral centre

P Laghaei Farimani (Vancouver) M Al-Amoodi (Vancouver) H Kahlon (Vancouver) T Ailon (Vancouver) C Dandurand (Vancouver) S Paquette (Vancouver) N Dea (Vancouver) J Street (Vancouver) R Charest-Morin (Vancouver) CG Fisher (Vancouver) MF Dvorak (Vancouver) B Kwon (Vancouver)*

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Background: Mountain biking (MTB) is an increasingly popular sport that has been associated with serious spinal injuries, which can have devastating effects on patients and significant impacts on healthcare resources. Herein, we characterized the occurrence of these MTB spinal injuries over a 15-year period and analyzed the affiliated acute-care hospital costs. Methods: Patients seen at Vancouver General Hospital for MTB spinal injuries between 2008-2022 were retrospectively reviewed. Demographics, injury details, treatments, outcomes, and resource requirements for acute hospitalization were collected. The Canadian Institute for Health Information was referenced for cost analysis. Results: Over the 15 years of analysis, 149 MTB spinal injuries occurred. The majority (87.2%) were male. 59 (39.6%) were associated with spinal cord injury; most of these were in the cervical spine (72.3%) and majority were AIS