Title

UTILITY OF TRANEXAMIC ACID (TXA) FOR RESECTION OF INTRACRANIAL MENINGIOMAS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Publication Date

2022

midline gliomas with either biopsy/LITT or biopsy alone. METHODS: Patients with midline intraxial tumors surgically treated at our tertiary care referral center were identified using our established database. Twenty-one patients managed either with biopsy/LITT or needle biopsy from 2015 to 2021 were included. Demographics and clinical records including, among others, length of hospital stay, preoperative lesion size, ablation volume, perioperative complications, adjuvant treatment, and stratified overall survival (OS) were collected. RESULTS: The two cohorts were composed of 7 patients who underwent LITT, and 14 biopsies. The mean age was 60.95y (25-82). The average tumor volumes were 16.99 cm^3 and 15.41 cm^3 for LITT and biopsy, respectively. No post-surgical complications were found in the LITT group, one patient had a postsurgical hemorrhage after biopsy. The mean OS was 20.28 ± 9.63 months in the LITT group, which was greater but not statistically significant than in the biopsy group (11.05 ± 4.45 months) (p = 0.605). CONCLUSION: Our results show that LITT is as safe as needle biopsy for the treatment of adult midline gliomas, and may offer a survival benefit given its cytoreductive properties.

SURG-29. CAN NEOADJUVANT CHEMOTHERAPY INCREASE EXTENT OF RESECTION IN DIFFUSE LOWER-GRADE GLIOMA?

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INTRODUCTION: Maximal safe surgical resection remains front-line treatment for diffuse lower-grade gliomas (DLGGs). Greater extent of resection (EOR) can delay transformation, control seizures, and improve survival. EOR is limited by the infiltrative nature of DLGGs and eloquent brain location preponderance. We investigated the role of neoadjuvant chemotherapy in tumour volume reduction (TVR) for cases in which a meaningful EOR was deemed unachievable. METHODS: Retrospective review (2000-2020) of patients in a large tertiary UK brain tumor centre who serendipitously underwent management that did or could mimic a neoadjuvant chemotherapy pathway. Inclusion criteria: >18 years at diagnosis; histologically-proven WHO grade 2 supratentorial glioma; received chemotherapy alone after biopsy then +/- debulking. Tumour volume delta +/- EOR were calculated on serial MRI T2/FLAIR sequences using a semi-automated quantitative analysis tool (Smartbrush, BrainLab® AG). RESULTS: Group 1 (neoadjuvant chemotherapy and then surgery, n=4): debulking was considered unachievable initially but then possible post-chemotherapy. Median TVR post-chemotherapy was 16.90% (range 0.45–64.90%). Mean EOR was 68.67% (33.72–100%). Median overall survival (OS) and progression free survival (PFS) were 85 (18–154) and 62 (13–153) months, respectively. Group 2 (biopsy followed by chemotherapy alone, n=7): debulking was considered unachievable initially. Median TVR post-chemotherapy was 25.68% (-294.95–46.02%, one patient progressed during chemotherapy). Median OS and PFS were 92 (6–135) and 27 (3–80) months, respectively. On re-review, and based on Group 1 results, some Group 2 patients may have been able to undergo debulking with meaningful EOR post-chemotherapy. CONCLUSIONS: Chemotherapy can have a significant impact on reducing tumour volumes, such that cases initially deemed unsuitable for debulking may be converted into those in which a meaningful EOR can be achieved. Larger, multicentre, retrospective studies, and prospective trials are needed to determine the role of chemotherapy as a neoadjuvant tool in the management of DLGGs.

SURG-30. SURGICAL MANAGEMENT OF A RARE SACROCOCCYGEAL MYXOPAPILLARY EPENDYMOMA OF THE GLUTEAL REGION: CASE ILLUSTRATION AND SYSTEMATIC LITERATURE REVIEW

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Ependymomas are rare tumors originating from neuroepithelial cells lining the wall of the ventricles or central canal of the spinal cord. While these tumors mainly occur within the central nervous system (CNS), there are occasional reports in children and young adult patients with a primary tumor occurrence outside of the CNS. Ependymomas of the sacrococcygeal region have been infrequently described in the literature with no standard of care established. We present a case report and review of the literature regarding this rare entity. A 24-year-old woman presented with right gluteal pain worsened by sitting and a palpable soft tissue mass of the sacrococcygeal region. Magnetic resonance imaging revealed a 3.7 cm cystic mass centered in the right gluteal region. Histology revealed myxopapillary ependymoma. The patient underwent an interdisciplinary neurosurgical and orthopedic oncology en bloc resection of the ependymoma, which intraoperatively appeared to originate from the coccygeal nerve. Through our systematic literature review, we identified 38 studies describing 78 unique cases of myxopapillary ependymoma occurring in the sacrococcygeal region without extension into the CNS. The exact presentation of sacrococcygeal ependymomas is variable. Given their location and propensity for drainage, they are frequently misdiagnosed as pilonidal cyst. Recurrence occured in 16.7% of cases described, typically within 20 years. Rate of metastasis was 20%. The primary means of management for sacrococcygeal myxopapillary ependymoma is complete surgical resection including excision of the neighboring sacrum or coccyx, when involved. Ultimately, we demonstrate that a myxopapillary ependymoma may present as an isolated gluteal mass attached to the coccygeal nerve, without frank CNS involvement. Furthermore, an interdisciplinary approach to surgical resection of this lesion appears to represent an effective treatment modality.

SURG-31. UTILITY OF TRANEXAMIC ACID (TXA) FOR RESECTION OF INTRACRANIAL MENINGIOMAS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Due to its anti-fibrinolytic action, tranexamic acid (TXA) can be utilized to help maintain hemostasis during surgical operations. With respect to surgery for intracranial tumors, we hypothesize that TXA could help mitigate blood loss during resection of highly vascular tumors such as meningiomas. We therefore conducted a systematic review of the literature and meta-analysis to analyze the effects of TXA administration in patients undergoing surgical resection of intracranial meningioma. Study inclusion criteria were (1) primary data articles describing use of TXA in surgical resection of meningioma. In this meta-analysis, which included four primary comparative studies, outcome measurements between TXA and non-TXA groups were compared. Primary outcomes included operative length, complications, transfusion requirements, estimated blood loss, and postoperative Hb for TXA versus non-TXA (control) groups. Pooled-comparative analysis was conducted for each of these perioperative variables and formal meta-analysis was applied toward statistically significant parameters. A total of 221 patients were analyzed (110 TXA, 111 non-TXA). Patient age (p = 0.1632), gender (p = 0.8317), and tumor location (p = -.8334) were similar for TXA and control groups. TXA was associated with decreased complication rate (logRR: -0.85; CI95% = -1.49 to -0.22; p = 0.0087), decreased transfusion requirement (logRR: -0.50; CI95% = -0.92 to -0.08; p = 0.0039), reduced blood loss (SMD: -1.76; CI95% = -3.21 to -0.31; p < 0.0001), and increased postoperative Hb (SMD: 0.46; CI95% = -0.15 to 1.07; p < 0.0001). In three trials, TXA was administered intravenously as a loading dose of 20 mg/kg for 20 minutes preoperatively with an intraoperative maintenance rate of 1mg/kg/hr; in one trial, administration design was identical except that infusion rate of the 20 mg/kg preoperative loading dose was unspecified. TXA may be associated with reduced complications, transfusion requirements, perioperative estimated blood loss, and increasedpostoperative Hb when administered perioperatively for surgical resection of intracranial meningiomas.

SURG-32. A NOVEL MACHINE LEARNING APPROACH FOR MODELING THE PREDICTIVE VALUE OF COMORBIDITY INDICES IN PITUITARY SURGERY

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Although pituitary adenomas (PAs) are common intracranial tumors, literature evaluating the utility of comorbidity indices for predicting perioperative complications in patients undergoing pituitary surgery remains limited, thereby hindering the development of complex models that aim to identify high-risk patient populations. Accordingly, we utilized comparative modeling strategies to evaluate the predictive validity of various comorbidity indices and combinations thereof in predicting key pituitary surgery outcomes. The Nationwide Readmissions Database was used to identify patients who underwent transsphenoidal pituitary tumor operations (n=19,653) in 2016-2017. Patient frailty was assessed using the Johns Hopkins Adjusted Clinical Groups (JHACG). Charlson Comorbidity Index (CCI) and Elixhauser Comorbidity Index (ECI) were calculated for each patient. Five sets of generalized linear mixed-effects models were developed, using 1) Frailty, 2) CCI, 3) ECI, 4) Frailty+CCI, or 5) Frailty+ECI as the primary predictor. Complications investigated included inpatient mortality, non-routine discharge (e.g., to locations other than home) , length of stay (LOS) within the top quartile, cost within the top quartile, and one-year readmission rates. Postoperative mortality occurred in 73 patients (0.4%),