Frailty Predicts Worse Outcomes for Meningioma Patients Undergoing Resection Irrespective of Age.

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ABSTRACT:

Meningiomas are the most common primary brain tumor with an estimated 29,000 new cases per year in the United States. Although generally benign, they can cause significant morbidity and mortality by compressing critical neurovascular structures or because their removal can be associated with additional complications. In the past few years, frailty, or a decrease in physiologic reserve, has been increasingly recognized as a mechanism of predicting outcomes and risk of complications with surgical interventions. The modified frailty index, or mFI, was created using 11 variables and has been validated and accepted in the literature to measure frailty. A large body of neurosurgery literature has recently demonstrated the value of the mFI in predicting complications among neurosurgical procedures. However, the overwhelming majority of this literature is for spine procedures. In fact, only three published studies demonstrate the predictive value of frailty for cranial tumor patients. Here, we studied the effect that increasing frailty has on outcomes after craniotomy for meningioma resection.

Method: This is a retrospective cohort study conducted between August 2012 and May 2018. We identified all patients who underwent craniotomy for meningioma resection. Patients were categorized into non-frail (mFI=0) and frail (mFI ≥1) groups. Hospital length of stay (LOS), discharge location, readmission rates, and reoperation rates were the primary outcomes measured. A secondary analysis was conducted examining the effect that age alone has on these variables. For continuous variables (LOS), groups were compared using a two-sample T-test. For categorical (binary) variables, groups were compared using Fisher’s exact test.

Results: Seventy six patients met the inclusion criteria. The average age was 55.8±1.8. Seventy percent were female and 30% were male. Frail patients (mFI≥1) were more likely to be older (avg. age 64.1±2, p<0.0001). There were no significant differences in sex or tumor location (skull base vs. non-skull base) between the non-frail and frail groups (p=0.3183 and p=0.2439, respectively). Frailty was associated with increased hospital LOS (p=0.0218) and reoperation rate (p=0.029). Frail patients were also more likely to be discharged to an inpatient rehabilitation facility or skilled nursing facility (SNF) (p=0.0002). There was a near significant increase in readmission rate in frail patients also (p=0.0545). Interestingly, older age alone (>65) did not increase LOS (p=0.2672), readmission (p=0.3182), reoperation (p=0.3505), or discharge to inpatient rehabilitation/SNF (p=0.0754).

Conclusions: Frailty was associated with worse outcomes in patients undergoing craniotomy for meningioma resection irrespective of age. These worse outcomes included increased length of stay, reoperation rate, more likely discharge to SNF/Rehabilitation.