

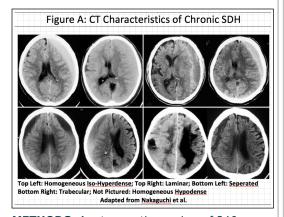
Surgical Management of Chronic Subdural Hematomas: Is a Burr Hole Enough?

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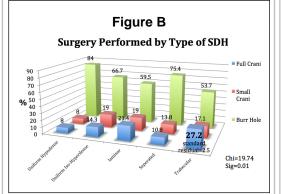


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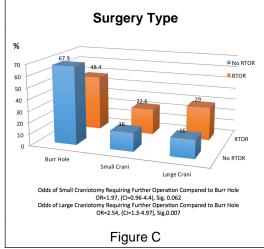
OVERVIEW: Chronic subdural hematomae (cSDH) are a common health problem affecting 3-10 per 100,000 people, with the incidence nearly twice as great in the elderly population (age>65).(1,2) There are many risk factors, such as cortical atrophy, anti-coagulant or antiplatelet use, and diabetes mellitus can contribute that contribute to this condition.(2,3) Despite its relative frequency, the management of this disease process is controversial. Surgical evacuation remains the mainstay of treatment for symptomatic cSDH, although medical therapy (e.g. corticosteroids) may be an option for poor surgical candidates.(1 The most common complication associated with surgical treatment is a recurrence rate ranging from 9-26% requiring re-operation.(3) Although neomembrane formation is an important part of the pathophysiology of cSDH, it is unclear whether larger craniotomies allowing coaguation of these membranes decreases the rate of recurrence compared to a burr hole or twist drill craniostomy. (1,4,5).



METHODS: A retrospective review of 246 consecutive patients undergoing surgical evacuation of cSDH from January, 2010 through December, 2011 was performed. Each individual chronic SDH was treated as a subject. The appearance of the SDH was classified by the system outlined by H. Nakaguci et al, (6). The type of surgery was defined as 1-2 burr holes, small craniotomy (<3 cm), and large craniotomy (>3cm). Clinical data were collected from the EMR. Data was analyzed with Student's T test, Two-way ANOVA, Chi-Square tests and binary logistic regression model. Data was analyzed using IBM SPSS for Macintosh version 20.



RESULTS: In the 246 patients enrolled there were 302 cSDH. 342 operations were performed in total. 267 (88.4%) required only one operation and 35 (11.6%) required more than one surgery. The character of cSDH did significantly effect which surgery was performed, (p=0.01), with trabecular types receiving full craniotomy more often. The character of cSDH also significantly correlated with RTOR, (Chi=19.7, p=0.03), with trabecular types requiring reoperation more often. However when controlling for the CT characteristics, a small craniotomy had 1.97 greater odds (p=0.062) and full craniotomy had 2.54 greater odds (p=0.007) than a burr hole. In this series, 12, (3.6%) of all operations were complicated by an acute SDH. All had received a large craniotomy previously, (p=0.00). Subjects were predominantly male (69.9%) and males had a higher risk of RTOR (OR=2.34, p=0.049). There was not a significant difference in the use of anticoagulant or antiplatelet usage, age, laterality or bilaterality and presence of diabetes between patients who had one or multiple operations. The character, presence of membranes, width or midline shift did not appear to have significant effect on rate of RTOR.



DISCUSSION: While there have been studies looking at the risk of cSDH recurrence according to CT characteristics or according to type of surgical procedure, few large studies have looked at these together. Some authors suggest that a craniotomy is most effective in management of cSDH most often associated with multiple membranes (trabecular type)(1).In our study, trabecular cSDH received full craniotomies at a higher rate (Figure B). However, when controlling for CT characteristics, the rate of RTOR in patients undergoing RTOR was statistically significant (Figure C). In addition, all aSDH resulted from full craniotomies (FigureD)

Figure D								
	Character of SDH Operated on which Resulted in an Acute SDH							
	Homogeneous Hypodense	Homgeneous Iso-Hyperdens	e	Laminar	Separated	Trabecular	Total	
Led to Acute	0 SR=-1.5	1 (8.3%) SR=9		2 (16.7%) SR=0.3	1 (8.3%) SR=9	8 (66.7%) SR=2.5	12	
Not Acute	60	65		46	67	92	318	
Chi	10.75 Sig=0.03 (SR-Standard Residual)							
Type of Operation that Led to an Acute SDH								
	Burr Hole(s) Small Crani La		La	rge Crani	Total	Total		
Led to Acute	0 -2.8	0 -1.4	12 6.6		12	12		
Not Acute	121	57	49)	318	318		
					330			
Chi	54.9 Sig=.00							

Conclusions: Our study suggests that burr holes for evacuation of cSDH are superior to small craniotomies and full craniotomies with respect to RTOR, despite the CT characteristics. In addition, they are significantly less likely to result aSDH. Therefore, while a burr hole may not always be enough, a craniotomy may be too much.

References

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