

Harminder Singh MD; Muhammed Burhan Janjua MD; Mudassir Ahmed; Sivashanmugam Dhandapani; Elizabeth Mauer;
Theodore H. Schwartz MD, FACS; Mark M. Souweidane MD
Department of Neurorlogical Surgery

Introduction

Colloid cysts are slow growing benign neoplasms comprising of about 0.5-2% of all intracranial tumors. Due to their low incidence, the demographic and clinical risk factors predicting acute neurological deterioration and/or sudden death have not been well described in the literature. The objective of this study is to identify the risk factors necessitating emergent surgical intervention in patients with colloid cyst who presented in extremis.

Methods

A retrospective MEDLINE literature review of all case reports and case series was performed utilizing keywords "colloid cyst and sudden death". The authors included 4 patients from their own experience. All patients who presented with signs and symptoms of acute neurological deterioration and had a radiographic and/or histo-pathologic diagnosis of colloid cyst were included. Patients with the incidental finding of colloid cyst and/or who did not present acutely were excluded. Demographic data, presenting symptoms, physical exam, surgical interventions, and outcomes were recorded.

Table 1

		N Total	N	Mean	SD	Median	Min	Max	Independent sample t-test p-value	Wilcoxon rank-sum test p-value
Age	Did Not Die	140	45	30.93	12.68	32	1	52	0.866	0.591
	Died		95	30.54	13.49	29	6	66		
Cyst Size (cm)	Did Not Die	80	13	1.64	1.16	1.2	0.4	4.6	0.243	0.040
	Died		67	2.05	0.88	1.9	1	5		

Table 2

		N Total	N	Mean	SD	Median	Min	Max	Independent sample t test p-value	Kruskal Wallis rank- sum test p-value
Age	Died Prior to any Intervention	140	53	28.77	12.29	27	6	62	0.340	0.2846
	Surgical Intervention and Survived		45	30.93	12.68	32	1	52		
	Surgical Intervention and Died		42	32.76	14.72	31.5	6	66		
Cyst Size (cm)	Died Prior to any Intervention	80	50	2.02	0.92	1.85	1	5	0.317	0.0827
	Surgical Intervention and Survived		13	1.64	1.16	1.2	0.4	4.6		
	Surgical Intervention and Died		17	2.14	0.76	2	1.1	3.5		

Results

140 patients with a mean age of 31 were analyzed. The most frequent presenting symptoms were headache (96%), change in mentation (72%), and nausea/vomiting (64%). On physical exam, 57% of patients had papilledema. 98.6% had a radiographic or autopsy proven diagnosis of hydrocephalus. The mean cyst size was 2.12 cm in males and 1.59 cm in females ($P=0.155$), and 1.64 cm in patients who survived and 2.05 cm in patients who died ($P=0.04$). The minimum cyst size was 0.4 cm in females and 0.8 cm in males. A greater percentage of females died prior to any intervention than males; 32% vs. 13%, respectively ($p=0.09$). 100% of patients who had no surgical intervention performed died, versus 48% of patients who had surgical intervention ($p<0.0001$). Patient age was not significantly associated with outcome.

Conclusions

Patients with colloid cysts who have headaches (96%), in conjunction with a radiographic finding of hydrocephalus (98.6%) are at extremely high risk for acute neurological deterioration and sudden death.

Larger cyst size was associated with higher mortality, with or without intervention. Timely surgical intervention for patients in extremis can lead to survival in approximately half the patients. Females, even with smaller cyst sizes, are at higher risk for sudden death, and should be more aggressively managed.

Figure 1

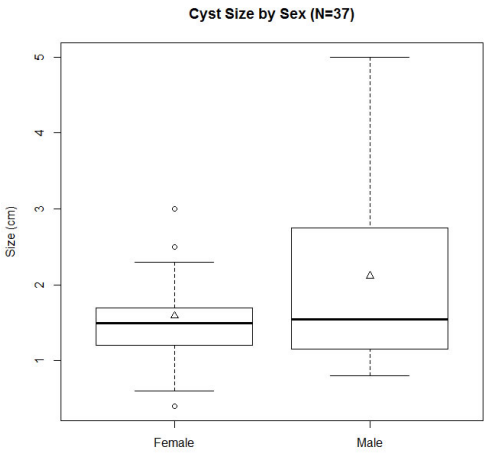
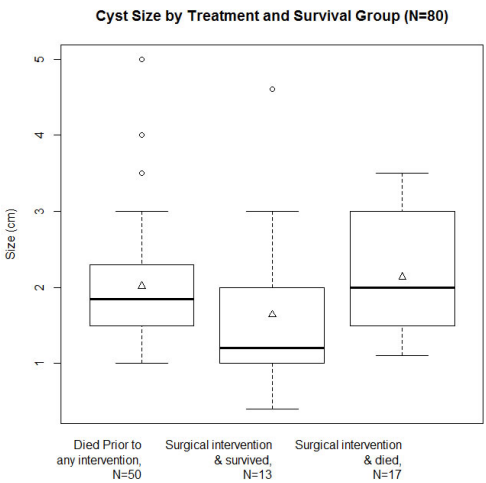


Figure 2



Learning Objectives

By the conclusion of this session, participants should be able to 1) Identify patients with colloid cysts who are at high risk for neurological deterioration 2) Understand the clinical presentation of patients in extremis with colloid cyst.

Table 3

N=140		Did Not Die	Died	p-value
Sex	Female	18 (36%)	32 (64%)	0.202
	Male	23 (51%)	22 (49%)	
	NA's	4	41	
Papilledema	No	9 (22%)	32 (78%)	0.162
	Yes	29 (36%)	51 (64%)	
	NA's	7	12	
Headaches	No	3 (60%)	2 (40%)	0.328
	Yes	42 (31%)	93 (69%)	
Nausea, Vomiting	No	13 (25%)	38 (75%)	0.277
	Yes	32 (36%)	57 (64%)	
Hydrocephalus	No	2 (100%)	0 (0%)	0.102
	Yes	43 (31%)	95 (69%)	
Cyst Hemm	No	41 (31%)	90 (69%)	0.2734
	Yes	4 (50%)	4 (50%)	
	NA's	0	1	
Surgical Intervention	No	0 (0%)	53 (100%)	<0.0001
	Yes	45 (52%)	42 (48%)	
Change in Mentation	No	14 (40%)	21 (60%)	0.305
	Yes	29 (29%)	72 (71%)	
	NA's	2	2	
Visual Symptoms	No	26 (30%)	60 (70%)	0.792
	Yes	17 (34%)	33 (66%)	
	NA's	2	2	
Seizures	No	36 (31%)	80 (69%)	0.796
	Yes	7 (35%)	13 (65%)	
	NA's	2	2	
Paresis	No	35 (30%)	82 (70%)	0.298
	Yes	8 (42%)	11 (58%)	
	NA's	2	2	
p-values from Chi-Square test or Fisher's Exact test as applicable				

References

1. Pollock BE, Schreiner SA, Huston J III: A theory on the natural history of colloid cysts of the third ventricle. *Neurosurgery* 46:1077–1083, 2000
2. Beaumont TL, Limbrick DD Jr, Rich KM, Wippold FJ 2nd, Dacey RG Jr. Natural history of colloid cysts of the third ventricle. *J Neurosurg.* 2016 Mar 11:1-11.