A Review of Middle Fossa Defects: A Case Series Examination of Risk Factors and Surgical Procedures

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Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the different entities of middle fossa defects; 2) Recognize the risk factors for middle fossa defects; 3) Understand the technical repair details.

Introduction

Middle fossa defects are increasingly common. Two variants are commonly seen: spontaneous temporal encephaloceles (TEs) and semicircular canal dehiscences (SCCDs). While the underlying cause of these conditions remains unknown, a common factor associated with both defects is obesity. Our investigation analyzes the correlation between obesity in the setting of metabolic syndrome (a constellation of medical conditions including obesity, hypertension, hyperlipidemia) and the development of TEs and SSCDs. Our technique for repair of the middle fossa is also presented.

Methods

This is a retrospective review of those patients undergoing middle fossa repair of either TEs or SSCDs at our institution between January 2010 and December 2017. Age, gender, middle fossa defect diagnosis, past medical history, and surgical procedure with 30 day follow up were recorded. Overweight was considered BMI 25.0-29.9, obese BMI > 30.0. All patients with the diagnosis of a middle fossa defect underwent a middle fossa exposure with repair employing hydroxyapatite cement (fig 1 & 2).

Fig 1 - Semicircular canal dehiscence

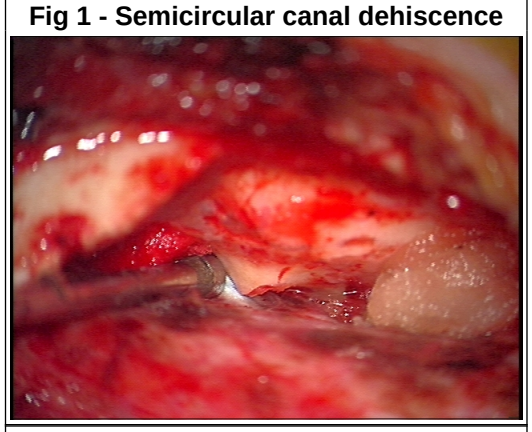
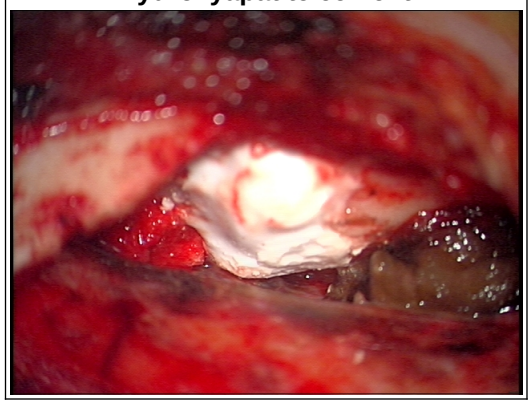


Fig 2 - Middle fossa repair with hydroxyapatite cement



Results

Sixteen patients met criteria to be included in the retrospective review (fig 3). Ten patients presented with TEs and seven presented with SSCDs. In both clinical entities, there was a predominance of men presenting with these defects. 12/16 (75%) of patients were categorized as either overweight or obese. Of the population of patients with a BMI > 25, 11/12 patients carried the diagnosis of hypertension. 7/12 patients also carried the concurrent diagnosis of hyperlipidemia (fig 4). Of note, only 1 patient required return to the OR for repair of persistent CSF leak.

Fig 3 - Patient demographics

Variable	No. (%)
Mean age in yrs, range	58.25, 30-83
Sex	
M	10 (62.5%)
F	6 (37.5%)
Temporal encephalocele	10 (62.5%)
Right	5 (50%)
Left	4 (40%)
Bilateral	1 (10%)
Superficial semicircular canal dehiscence	6 (37.5%)
Right	2 (33.3%)
Left	2 (33.3%)
Bilateral	2 (33.3% - symptomatic side only)
Mean follow up time in mos, range	7.75, 1.5-24

Fig 4 - Presence of risk factors

Case no.	BMI	TE	SSCD	HTN	HLD
1	34.9	+	-	+	-
2	20.2	+	-	-	-
3	40.2	+	-	+	-
4	33.8	-	+	+	+
5	22.3	+	-	-	-
6	22	-	+	-	-
7	27.1	+	-	+	+
8	35.7	+	-	+	+
9	32.4	+	-	+	-
10	25.7	+	-	+	+
11	39.2	+	-	+	+
12	24	-	+	-	-
13	37	+	-	+	-
14	28.2	-	+	-	-
15	31.3	-	+	+	+
16	29.8	-	+	+	+

Conclusions

This is the first report that reviews the possibility of metabolic syndrome as a risk factor for developing middle fossa defects. Although a small review, there appears to be a correlation between the presentation of this clinical triad and the presence of TEs or SSCDs. We also report a surgical technique in the repair that provides durable results.

References

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