Temporoparietooccipital Disconnection in Epilepsy Surgery: Case Series

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Introduction

Surgical techniques for the treatment of refractory hemispheric epilepsy evolved from ressection to disconnection techniques, with the aim to mantain efficacy with less morbidity (1). In multilobar subhemispheric epilepsy the disconnection techniques, although recently described, are also been used more frequently, but their efficacy in epilepsy control and safety have only been seldom described (1). The aim of this study is to evaluate the outcome and morbidity of patients who underwent temporoparietooccipital disconnection in Epilepsy Surgery Group from Centro Hospitalar de Lisboa Ocidental.

Methods

The authors performed a retrospective analysis of patients treated in our centre who underwent temporoparietooccipital disconnection. Data were collected by consultation of Epilepsy Surgery prospective database, National Patient Registry and telephonic interview if missing data. Pre-operative data analysed included demographic characteristics, early insults, epilepsy duration and imaging findings. Post operative data analysed were: seizure outcome according to Engel classification, anatomical pathology results and complications. Data were analysed with basic statistical tests using Microsft Excel 2011.

Results

Between 2010 and 2015 ten patients underwent temporoparietooccipital disconnection. Six patients were male and 4 were female. The median age was 5,5 years at time of surgery (range 2-52 years). Patient's median age of seizure onset was 1,4 years (range 0,2-7 years) and median duration of epilepsy before surgery was 3 years (range 1,8-46 years). Six patients underwent right side surgery and 4 left side posterior disconnection - table 1.

Table 1

	Gender		Age at seizure onset	Epilepsy duration	Age at surgery	Etiology	
n=10	F	M	Median 1,4y (2m-7y)	Median 3y (22m-46y)	Median 5,5y (2-52y)	Ischemia	FCD
	4	6				5	3

Pre-operative data

One patient died during follow-up and 3 patients underwent hemispherotomy for seizure recurrence. The seizure outcome of the other 6 patients was Engel I in 4 patients (Ia in two, Ib in one and Ic in one), Engel IIIa in one patient, and Engel IVB in one patient, after a median follow-up of 41 months (mean 38,5 months, range 8-57 months). There was morbidity in two patients: one required a re-operation due to insuficient disconnection and other patient had a malignant brain edema that required craniectomy and remained in vegetative state after surgery - table 2.

Table 2

	Side		Invasive study		Morbidity	Outcome				Follow-up (m)
n=10	L	R	yes	no	1 malignant cerebral edema, 1 re-operation due to insuficient disconnection	I	III	IV	Hem.	38.5 (8-57)
	4	6	2	8		4	1	1	3	

Post operative data

Discussion

Our series had a similiar number of patients as previosly published series. Our lenght of follow-up was a higher than some series. The percentage of patients with Engel I outcome in our series was lower the most of other series, probably reflecting the Multidisciplinary Team and Surgeons learning curve as well as the complexity of these patients - table 3.

This study was limited by the low number of patients, by retrospective analysis and for being a single center analyses. Prospective and multi-center studies could help in more accurate seizure freedom prediction.

Table 3

Series	n	Age (years)	Surgery side	Outcome (Engel)				Follow-up (months)
				I	II	III	IV	
D'Agostino et al.[2] 2004	4		Left – 3 Right - 1	1 (25%)	1 (25%)	2 (50%)		
Daniel et al.[1] 2007	3	7 (2,5 – 10)	Left – 1 Right 2	3 (100%)				28 (12 - 36)
Mohamed et al.[3] 2011	16	8 (2m – 18y)	Left – 9 Right – 7	9 (56%)	1 (6%)	4 (25%)	2 (13%)	52 (12 - 114)
Dorfer et al.[4] 2013	10	Median 8.7 (4.2-22.1)	Left - 3 Right -7	9 (90%)				25,2 (4-97.2)
Guan et al[5] 2013	16	14.1 (3-37)	Left - 5 Right -5	13 (81%)	1 (6%)	2 (13%)		19,2 (6-47)
Sugano et al[6] 2014	10	2,3 (8m -8y)	Left - 5 Right -5	8 (80%)				24
	10	5,5 (2-52)	Left – 4 Right - 6	4 (40%)		1 (10%)	1 10%	38.5 (8-57)

Comparison with published series

Conclusions

Temporoparietooccipital disconnection is a safe and effective technique in seizure control that can spare motor function in carefully selected patients.

Learning Objectives

Acknowledge temporoparietooccipital disconnection as an effective treatment in multilobar refractory epilepsy.

References

1 - Daniel et al - "Posterior quadrantic epilepsy surgery: technical variants, surgical anatomy and case series" - Epilepsia (2007) 48:1429-1437

2 - D'Agostino et al - "Posterior quadrantic epilepsy or hemimegalencefaly" - Neurology (2004) 2214-2220

3 - Mohamed et al - " Temporoparietaloccipital disconnection in children with intractable epilepsy" - J Neurosurg Pediatrics (2011) 7:660-670

4 - Dorfer at al - "Disconnective surgery in posterior quadrantic epilepsy: experience in a consecutive series of 10 patients" - Neurosurg Focus (2013) 34:1-6

5 - Guan et al - "Temporoparietooccipital and parietooccipital disconnection in patients with intractable epilepsy" - Neurology Asia (2013) 18(supplement 1):57-59

6 - Sugano et al - "Posterior quadrant disconnection surgery for Sturge-Weber syndrome" - Epilepsia (2014) 55(5):683-689