

# Disputes & Debates: Editors' Choice

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## Editors' Note: One-Stage, Limited-Resection Epilepsy Surgery for Bottom-of-Sulcus Dysplasia

In "One-Stage, Limited-Resection Epilepsy Surgery for Bottom-of-Sulcus Dysplasia," Macdonald-Laurs et al. described the performance of corticectomy guided by MRI and electrocorticography (ECoG) in 38 patients with bottom-of-sulcus dysplasia (BOSD). They found that at a median of 6 years postop, 87% of patients were seizure free and noted that their outcomes are similar to those reported in a small series of patients with BOSD who underwent stereotactic thermocoagulation (STC) and laser interstitial thermal therapy (LITT). Hu et al. reported that based on their recent LITT trial, in which they found that 6 of 7 (86%) patients with BOSD were seizure-free 6 months postop, they recommend minimally invasive procedures for BOSD. Harvey et al. agreed with the use of STC or LITT for BOSD in locations that are not easily accessible via a small craniotomy. However, these procedures preclude the use of ECoG to determine epileptogenicity, histopathologic confirmation, and genetic testing of the tissues. In addition, STC and LITT pose risk to surrounding normal cortex and are not widely available. The authors all agree that there is a need for additional long-term outcome data using different treatment strategies in larger cohorts of patients with BOSD.

Ariane Lewis, MD, and Steven Galetta, MD  
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## Reader Response: One-Stage, Limited-Resection Epilepsy Surgery for Bottom-of-Sulcus Dysplasia

Wenhan Hu (Beijing), Baotian Zhao (Beijing), Jianguo Zhang (Beijing), and Kai Zhang (Beijing)  
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Dr. Macdonald-Laurs et al. reported 38 patients with bottom-of-sulcus dysplasia (BOSD), who underwent a limited corticectomy and whose seizure outcomes indicated minor neurologic complications,<sup>1</sup> echoing previous literature.<sup>2,3</sup> Although subtle changes can be found from structural MRIs, combined fluorodeoxyglucose (FDG)-positron emission tomography (FDG-PET) and MRI imaging can produce high sensitivity in detecting these small lesions. Because these lesions are well confined, sulcus-centered resections could be considered for better function protection, while also guaranteeing the seizure outcome.<sup>4</sup>

The authors implied the outcome of conventional open surgery is similar to that of laser interstitial thermal therapy (LITT). In our recent LITT clinical trial, a subcohort of 7 patients with BOSD were included—6 achieved an Engel IA outcome and 1 an Engel IB outcome, postoperatively, with a mean follow-up of 6 months. In addition, patients were willing to consent to LITT, given its minimally invasive nature. Considering BOSD is mostly located outside the temporal lobe, the traditional viewpoint that extratemporal surgeries are less effective than temporal lobe ones may not apply to this condition.<sup>5</sup> The existing research stems from all

Author disclosures are available upon request ([journal@neurology.org](mailto:journal@neurology.org)).

retrospective studies—as such, multicenter collaborations could yield high class evidence that may profoundly change the treatment strategies for BOSDs.

1. Macdonald-Laurs E, Maixner WJ, Bailey CA, et al. One-stage, limited-resection epilepsy surgery for bottom-of-sulcus dysplasia. *Neurology*. 2021;97(2):e178-e190.
2. Harvey AS, Mandelstam SA, Maixner WJ, et al. The surgically remediable syndrome of epilepsy associated with bottom-of-sulcus dysplasia. *Neurology*. 2015;84(20):2021-2028.
3. Besson P, Andermann F, Dubeau F, Bernasconi A. Small focal cortical dysplasia lesions are located at the bottom of a deep sulcus. *Brain*. 2008;131(pt 12):3246-3255.
4. Zhao B, Zhang C, Wang X, et al. Sulcus-centered resection for focal cortical dysplasia type II: surgical techniques and outcomes. *J Neurosurg*. 2020;135(1):266-272.
5. Jobst BC, Cascino GD. Resective epilepsy surgery for drug-resistant focal epilepsy: a review. *JAMA*. 2015;313(3):285-293.

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## Author Response: One-Stage, Limited-Resection Epilepsy Surgery for Bottom-of-Sulcus Dysplasia

A. Simon Harvey (Melbourne) and Emma Macdonald-Laurs (Melbourne)  
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We thank Dr. Hu et al. for their encouraging comments on our article.<sup>1</sup> Both our groups advocate minimal, targeted resections of bottom-of-sulcus dysplasia (BOSD),<sup>1,2</sup> and we further promote omitting intracranial EEG monitoring in MRI-positive cases. As noted in references 41–45 in our article, laser interstitial thermal therapy (LITT) and stereotactic thermocoagulation (STC) are reported in BOSD, further minimize surgical intervention, and are appropriate for BOSD on the medial and basal cerebral surfaces—occurrences which are not as easily accessed with a small craniotomy as BOSD on the cerebral convexity. STC is typically undertaken in patients who undergo previous stereo-EEG with an electrode directly sited in an MRI-positive BOSD. The potential disadvantages of LITT and STC are the lack of confirmation of epileptogenicity with electrocorticography, a pathologic diagnosis from histopathology, and identification of genetic variants from deep sequencing of tissue.

It is important to consider that limiting thermal injury to the dysplastic cortex of the BOSD and avoiding injury to the surrounding normal cortex or white matter tracts is sometimes challenging with LITT and STC. In addition, many neurosurgical centers around the world, especially pediatric centers, do not have LITT or STC capabilities such that targeted small resections are their best option. We eagerly await publications from Dr Hu's group and others reporting large numbers of patients with BOSD undergoing LITT and STC with long follow-up periods, given the potential for temporary seizure remissions, and MRI figures highlighting the preoperative dysplastic and postoperative thermal lesions.

1. Macdonald-Laurs E, Maixner WJ, Bailey CA, et al. One-stage, limited-resection epilepsy surgery for bottom-of-sulcus dysplasia. *Neurology*. 2021;97(2):e178-e190.
2. Zhao B, Zhang C, Wang X, et al. Sulcus-centered resection for focal cortical dysplasia type II: surgical techniques and outcomes. *J Neurosurg*. 2020;135(1):266-272.

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## Long-term Follow-up, Quality of Life, and Survival of Patients With Lambert-Eaton Myasthenic Syndrome

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In the article “Long-term Follow-up, Quality of Life, and Survival of Patients With Lambert-Eaton Myasthenic Syndrome” by Lipka et al.,<sup>1</sup> table 2 was previously missing from the paper and is shown below. Further, the references to “table 1” in the last paragraph of the Results section, on page eS16, should read “table 2.” The authors regret the errors.

### Reference

1. Lipka A, Boldingh M, van Zwet E, et al. Long-term follow-up, quality of life, and survival of patients with Lambert-Eaton myasthenic syndrome. *Neurology*. 2020;94(5):eS11-eS20.

**Table 2** Predictors of Quality of Life in Patients With LEMS

Univariate analysis					
	No. of patients	PCS (95% CI)	<i>p</i>	MCS	<i>p</i>
<b>Age</b>			0.78		0.96
<50	19	57.1 (46–68)		72.0 (61–82)	
≥50	23	55.0 (45–64)		71.6 (63–81)	
<b>Sex</b>			0.22		0.18
Female	23	51.9 (42–62)		67.7 (58–78)	
Male	19	60.8 (50–72)		76.7 (68–86)	
<b>Partner</b>			0.079		0.018*
Yes	34	60.0 (51–67)		75.6 (69–82)	
No	8	43.0 (22–64)		55.8 (35–76)	
<b>Employment</b>			0.035*		0.042*
Employed	10	71.8 (56–88)		85.8 (81–91)	
Housekeeping	4	53.4 (22–85)		58.1 (28–115)	
Disability	9	41.6 (32–52)		71.0 (45–71)	
Retired	19	54.9 (43–67)		71.7 (59–83)	
<b>Associated tumor</b>			0.58		0.77
No tumor	36	56.8 (49–64)		71.4 (65–78)	
SCLC	6	51.0 (19–83)		74.3 (42–107)	
<b>Other autoimmune disease</b>			0.57		0.54
Yes	11	59.4 (44–75)		68.4 (52–85)	
No	31	54.7 (46–63)		73.0 (65–81)	
<b>Muscle weakness</b>			<0.0001*		0.14
No weakness	9	83.3 (71–95)		84.5 (69–100)	
Limited to legs only	6	57.2 (28–87)		69.1 (42–96)	
Generalised	27	46.6 (40–53)		68.2 (60–76)	

Continued

**Table 2** Predictors of Quality of Life in Patients With LEMS (Continued)

Univariate analysis					
	No. of patients	PCS (95% CI)	<i>p</i>	MCS	<i>p</i>
<b>Medication</b>			0.39		0.21
None	6	66.3 (35–98)		79.6 (52–107)	
Symptomatic	23	54.9 (47–63)		74.1 (67–81)	
Immunosuppression	10	51.0 (35–67)		63.0 (46–80)	
<b>Modified Rankin Scale</b>			0.008*		0.085
<b>Correlation coefficient (r)</b>			–0.44		–0.29
0	2	68.6 (–234 to 372)		62.9 (–306 to 432)	
1	2	77.8 (–30 to 185)		85.4 (17–153)	
2	25	52.2 (45–60)		72.3 (65–79)	
3	6	44.3 (18–71)		59.6 (30–89)	
4	1	8.8 (n/a)		18.3 (n/a)	
Multivariate analysis					
	No. of patients	PCS	<i>p</i>	MCS	<i>p</i>
<b>Sex</b>			n/a		0.031*
Female	23			67.7	
Male	19			76.7	
<b>Partner</b>			0.018*		0.015*
Yes	34	60.0		75.6	
No	8	43.0		55.8	
<b>Employment</b>			0.036*		0.012*
Employed	10	71.8		85.8	
Housekeeping	4	53.4		58.1	
Disability	9	41.6		71.0	
Retired	19	54.9		71.7	
<b>Muscle weakness</b>			<0.001*		n.s. <sup>a</sup>
No weakness	9	88.3		84.5	
Limited to legs only	6	57.2		69.1	
Generalised	27	46.6		68.2	
<b>Modified Rankin Scale</b>			0.25		0.31
0	2	68.6		62.9	
1	2	77.8		85.4	
2	25	52.2		72.4	
3	6	44.3		59.6	
4	1	8.8		18.3	

\* Represents  $p < 0.05$  for comparison.

<sup>a</sup> Bonferroni correction (of post-hoc pooled parameter estimates of the generalized linear model) results in a  $p$ -value  $> 1$ .  
CI = confidence interval; MCS = mental composite score; PCS = physical composite score; SCLC = small cell lung cancer.

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