Original article

Epileptic Disord 2017; 19 (2): 152-65

Stereotactic bilateral transfrontal minimal radiofrequency thermocoagulation of the amygdalohippocampal complex for bilateral medial temporal lobe epilepsy: a retrospective study of 12 patients

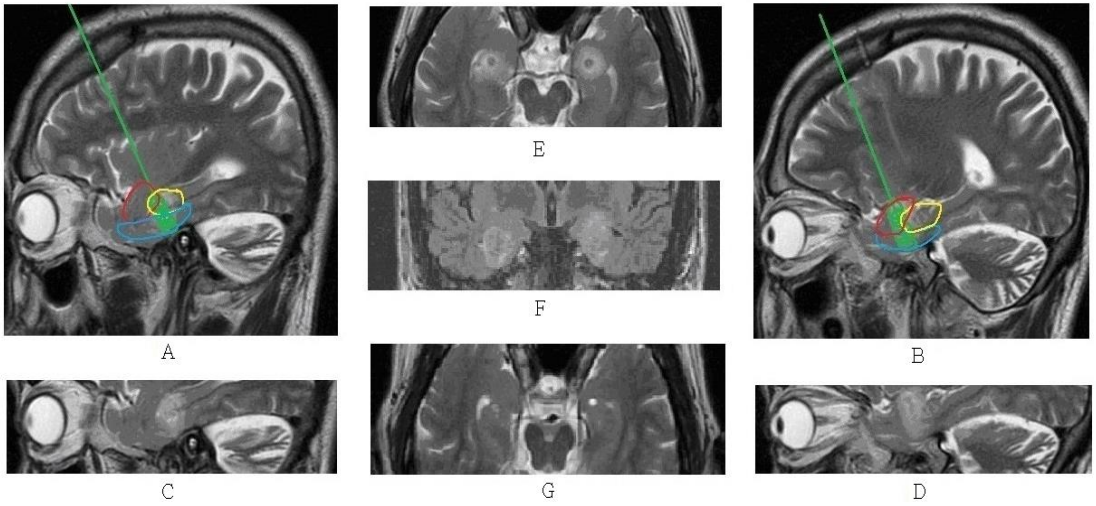
Quanjun Zhao [1], Tiejun Shi [1], Shaojie Cui [1], Zhaohui Wu [1], Wei Wang [1], Yunfeng Jia [1], Zengmin Tian [2], Fuli Wang [2], Feng Yin [2], Hulin Zhao [2], Xia Xiao [2], Haiying Wang [3], Changlan Cai [4], Huimin Luo [5]

[1] Neurosurgery Department, The 306 Hospital of PLA, Beijing
[2] Neurosurgery Department, Navy General Hospital, Beijing
[3] Psychology Department, Navy General Hospital, Beijing
[4] Radiotherapy Department, Navy General Hospital, Beijing
[5] Department of Neurosurgery, Luhe Hospital, Beijing, China

Received March 03, 2016; Accepted March 22, 2017

Epileptic Disorders

- **A total of 12 BMTLE patients were treated with bilateral transfrontal minimal RFTC of the amygdalohippocampal complex under limited coagulations. The volumes of coagulated lesions were less than 0.6cm^3. Clinical outcomes were evaluated using Engel's classification, the Liverpool Seizure Severity Scale (LSSS) 2.0, Wechsler Adult Intelligence Scale-Revised (WAIS-R), and Wechsler Memory Scale-Revised (WMS-R).**



Red circle: amygdala
Yellow circle: hippocampal head
Blue circle: parahippocampus
Green line: trajectory
Green area: coagulation zone
A: Coagulations on the right
B: Coagulations on the left
C: True coagulations on the right
D: True coagulations on the left
E: Axial scan of early MRI
F: Coronal scan of early MRI
G: MRI scan one year after surgery

bilateral RFTC of the amygdalohippocampal complex

Seizure control and neuropsychological evaluation

- **The follow-up time was 12–62 months. Five cases were classified as Engel Class I, two as Engel Class II, three as Engel Class III, and two as Engel Class IV. Seven patients not categorsied as seizure-free were re-evaluated by LSSS 2.0 after surgery and their average severity scores significantly declined (19.64±6.84) compared with baseline (t=7.603; p<0.001). Neuropsychological evaluation is shown below:**

	Before surgery	3–7 days after surgery	6 months after surgery	P^1	P^2	P^3
Full scale IQ	76.25±10.03	73.17±7.59	80.17±5.47	0.030*	0.007**	0.000**
Verbal IQ	74.00±11.09	72.50±8.86	80.83±9.03	0.390	0.001*	0.000**
Performance IQ	77.67±12.51	76.17±8.96	81.25±10.50	0.203	0.005*	0.000**
Global MQ	76.58±11.66	76.17±9.49	80.67±10.31	0.684	0.001*	0.000**
Verbal MQ	78.50±13.30	77.42±12.76	81.67±11.41	0.189	0.001*	0.000**
Visual MQ	71.50±11.52	71.92±8.61	74.58±9.10	0.691	0.007*	0.017*
Attention	76.58±18.23	75.25±14.70	81.83±14.83	0.496	0.012*	0.002*
Delayed recall	74.75±12.41	73.50±11.83	76.42±9.57	0.314	0.184	0.025*

Paired sample t-test: *significant; **highly significant

P^1, the difference between before and 3–7days after surgery;
P^2, the difference between before and 6 months after surgery;
P^3, the difference between 3–7days and 6 months after surgery.

Improvement of quality of Life and conclusion

Improvement of quality of life

	Pre operation	Post operation	*t*	*P*
Physical Functioning (PF)	96.250±6.077	96.667±4.924	-0.561	0.586
Role-Physical (RP)	39.583±16.714	4.583±16.714	-4.062	0.002*
Bodily Pain (BP)	98.000±5.326	98.000±5.326	0.000	1.000
General Health (GH)	36.667±9.847	68.083±10.157	-6.114	0.000**
Vitality (VT)	51.667±7.177	49.750±7.557	1.305	0.219
Social Function (SF)	42.183±9.815	69.448±10.725	-7.641	0.000**
Role-Emotional (RE)	44.443±16.415	63.891±17.166	-2.548	0.027*
Mental Health (MH)	40.500±7.243	57.667±10.299	-4.106	0.002*

Paired sample *t*-test: *significant; **highly significant

- **Conclusion: The safety of bilateral RFTC of the amygdalohippocampal complex was confirmed by the neuropsychological study. After operation, the qualities of life improved except Vitality. Therefore, bilateral RFTC of the amygdalohippocampal complex could be considered as a promising method, in addition to DBS and VNS, for patients with bilateral temporal lobe epilepsy.**