Retrospective Long Term Outcome Following Microvascular Decompression Surgery in Thai Patients with Trigeminal Neuralgia

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Objective: *To retrospectively evaluate 5-year pain-free symptoms and clinical outcome for trigeminal neuralgia (TN) patient population after microvascular decompression.*
Material and Method: *The authors reviewed the medical records of all Thai TN cases admitted at Ramathibodi Hospital, Mahidol University, and Ramkhamhaeng Hospital between 2001 and 2006. The 5-year pain-free symptoms and clinical outcome was determined using marginal homogeneity test (Stuart-Maxwell).*
Results: *There were 99 cases with TN. Women (75.6%) were affected more than men (24.4%). More often, the facial pain occurred on the right side of the face (72.8%) than on the left (27.2%). In 78.8% of cases, the facial pain was located along the mandibular division of the trigeminal nerve. In 19.2% of cases, the facial pain was located along the maxilla division of the trigeminal nerve and 30% of cases reported the pain along the combination of the maxilla and the mandibular division of the trigeminal nerve. Two percent of cases located pain along all three divisions. In 65.7% of cases, they reported their trigger points. Thirty-eight cases (38.4%) were operated at Ramkhamhaeng Hospital and 61 cases (61.6%) were diagnosed and treated at Ramathibodi Hospital, Mahidol University. Microvascular decompression surgery was the treatment of choice in all cases. As a final point, 97.9% of all cases who were pain free at the 5-year follow-up were significantly different between before and after treatment ($p<0.001$).*
Conclusion: *In Thai TN patients, the mandibular division of the trigeminal nerve was most commonly involved, in concordance with other population group studies. In the present study, microvascular decompression surgery is the treatment of choice in TN patient. In the 97.9% of all cases that were pain free at the 5-year follow-up, they were significantly different between before and after treatment ($p<0.001$).*

Keywords: *Trigeminal neuralgia, 5-year pain-free symptoms, Clinical outcome, Microvascular decompression*

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In Thailand, the peak incidence of trigeminal neuralgia (TN) is in the age range of 50 to 69 years[1]. This accounted for 46.8% of all TN in Thai patients[1]. While the incidence of TN accounted for 4.3 of 100,000 people in the United State[2-4]. The symptom of TN typically begins as paroxysmal and relapsing. There are pain-free intervals that might last months or years[5]. Although its etiology remains unclear, the major course is vascular compression at the trigeminal root entry zone[5,6]. The TN patients will suffer from severe facial pain when talking, eating, taking care of face, or doing dental hygiene. The aim of treatment in TN patients is a long-lasting alleviation of facial pain[4-10]. The palliative treatment for TN is medical therapy Carbamazepine as a first-line therapeutic agent[11,12]. The second-line agents include phenytoin, oxcarbazepine, sodium valproate, gabapentin, and lamotrigin[11,13,14]. Other pharmacotherapy includes amitryptyline, baclofen, clomipramine, dextromethorphan, lorazepam, pimozide, proparacaine hydrochloride, tizanidine, and tocainide[12]. The combination of each agent is recommended if monotherapy is unproductive[12,15]. Other treatments such as percutaneous radiofrequency lesioning, percutaneous ballon rhizotomy, or radiosurgery are alternative treatment if surgery is not indicated[9,16-22]. So far, the treatment of choice is microvascular decompression surgery[5,7,19-23]. In healthy TN patient, surgery is carried

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on when pain free cannot be achieved with medical treatment or their side effects are concerned. Around 50% of TN patient who had ineffective medical treatment needs surgery[5]. The objective of this study was to retrospectively evaluate 5-year pain-free symptoms and clinical outcome for trigeminal neuralgia (TN) patient population after microvascular decompression.

Material and Method

The authors reviewed the treatment of 99 patients who suffered from TN. The patients were divided into two groups. There were 38 (38.4%) patients in the first group treated at Ramathibodi Hospital and 61 (61.6%) patients in the second group, operated by Prof. Dr. Sira Bunyaratavej MD at Ramkhamhaeng Hospital between 2001 and 2006. TN inclusion criteria were composed of a history and the physical examination, which corresponded to the International Classification of Headache Disorders[24-27]. Analyzed information including general identification data, pain location, trigger point, treatment modalities, and pain free interval. This was reviewed from the medical records retrospectively between 2001 and 2006. Data were analyzed using marginal homogeneity test (Stuart-Maxwell) to assess the significance difference between before and after treatment groups. The present study already had been approved by the Institute Review Board.

Results

Ninety-nine cases of Thai TN patients were consecutively recruited and analyzed. Only one case was initially treated with radiosurgery because of surgical denial. Of all the cases, 98.9% (n = 98) underwent microvascular decompression surgery. From Table 1, women (75.8%) were affected more than men (24.2%). The average age was 58.2 years. Of all cases, 87.9% had the combination of NIDDM and hypertension as associated medical conditions. The duration of facial pain was between 5.1 days to 30 days before seeking treatment. Right sided pain was detected in 72.7% of cases and 78.8% of cases located the facial pain along the mandibular division of the trigeminal nerve. In those cases, 65.7% reported their trigger point. Most of the cases (94.9%) suffered from facial pain with irritable paresthesia. Microvascular decompression was performed initially in 98 cases. The most common operative findings were one or more arteries compression. Decompression technique was a separation of compression by interposioning technique with Teflon sponge. Arteriovenous malformation was found in two cases (7.7%). Acoustic tumor was reported in five cases (19.2%) and one case (3.8%) for epidermoid tumor. Radiosurgery was done in two cases including one case with surgical denial and another with recurrent facial pain. Facial pain free was followed-up for at least five years. In the cases, 84.8% reported completed facial pain free at 1- to 5-year- follow-up and 13.1% of cases were found completed facial pain free at the time of postoperation (more than one year) though after further follow-up. There was almost pain relief with occasional tiny irritable. No medication is needed in this group but self-care and avoiding physical and functional stress. Partial completed facial pain free was defined in this group. Table 2 shows that 97.9% of cases reported pain free. There was only one case without facial pain relief. Moreover, a complication was found in one case with surgical wound infection. From Table 2, using statistical test to see the marginal homogeneity test. P-value is less than 0.001. There is significant difference of the improvement between before and after microvascular decompression.

Discussion

This present study regarding TN in Thai patients is in concordance with most of the previous reports in other populations[1-5,7,12,17,21,26,28-30]. The authors similarly found that women were affected more commonly than men. Average age in this present study corresponded with previous findings, which is between 50 to 70 years[5,6]. Additionally, the right side of the face revealed more frequently affected than the left side which might be because of the anatomical basis[31]. The smaller foramen ovale and foramen rotundum are on the right side. They may be more compromised than the left. Most of the patients in the present study were referred from the dental clinic and most of them had poor oral hygiene and experienced some teeth removal[15,28,32]. The physical trigger point was found 65.7% of all cases. The medical condition, which is associated with TN cases included hypertension in 75% of cases in this present study. There was a complication in one case with surgical wound infection. Several studies were reported about the success of microvascular decompression surgery, which was in agreement with this present study[4,8,10,12,17-21,23,30,38-40]. In this present study, there was a number of artery compressing around root exit zone in the operative finding. However, no venous compression was found commonly in the operative

Table 1. Data characteristics of trigeminal neuralgia patient

Characteristics	Number	%
Sex		
Male	24	24.24
Female	75	75.76
Age (years), mean (SD)	99	58.22 (12.34)
Underlying disease		
NIDDM	22	22.22
Hypertension	74	74.75
Cardiovascular disease	3	3.03
Combination of underlying disease		
NIDDM + hypertension	87	87.88
Cardiovascular disease + hypertension	11	11.11
NIDDM + hypertension + CVD	1	1.01
Duration (month), median (range, (month))	99	3 (0.17, 30)
Location		
V1	2	2.02
V2	19	19.19
V3	78	78.79
Side		
Right	72	72.73
Left	27	27.27
Trigger point		
None	34	34.34
Yes	65	65.66
Paresthesia		
Yes	94	94.95
None	5	5.05
Number of arterial compression		
One artery	20	20.41
More than one artery	72	73.47
Complexity of artery	6	6.12
Number of venous compression		
None	84	85.71
One vein	13	13.27
Group of vein	1	1.02
Other causes of trigeminal nerve compression		
Arteriovenous malformation	2	7.69
Acoustic tumor	5	19.23
Adhesion	18	69.23
Epidermoid tumor	1	3.85
Pain free		
Unchanged pain	1	1.02
Complete pain free	84	85.71
Partial pain free	13	13.27
Follow-up (year), median (range (year))	98	1 (0, 9)
RS		
None	97	97.98
Treat with RS	2	2.02

NIDDM = non independent diabetes milletus; CVD = cerebrovascular disease; RS = radiosurgery

Table 2. Comparing before and after treatment of trigeminal neuralgia patients

Before treatment	After treatment			Total
	Unchanged pain	Complete pain free along 5 years f/U	Complete pain free within 1 year	
Facial pain (n = 99) (100%)	1 (1%)	84 (84.8%)	13 (13.1%)	98 (p = 0.0000)
Total	1 (1%)	84 (84.8%)	13 (13.1%)	98 (p = 0.0000)

One patient was undergone first treatment with radiosurgery and denied microvascular decompression surgery

finding. High volume experienced neurosurgeons could reduce morbidity and mortality rate when dealing with TN patients.

Conclusion

In the present study, the mandibular division of the trigeminal nerve was most commonly involved as in the other population group studies. Microvascular decompression surgery is proposed to be the treatment of choice in TN patients when other treatments fail or the request of the patients. There were 97.9% of all cases that were pain free at the 5-year follow-up with significant difference between before and after treatment ($p<0.001$).

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Potential conflicts of interest

None.

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การศึกษาย้อนหลังผลการรักษาด้วยจุลศัลยกรรมลดการกดทับเส้นประสาทของโรคปวดใบหน้าในผู้ป่วยไทย

ประเสริฐ ศัลย์วิวรรธน์, อภิรักษ์ บำเพ็ญบุญ, สรยุทธ ชำนาญเวช

วัตถุประสงค์: *เพื่อศึกษาย้อนหลังผลการรักษาทางคลินิกด้วยจุลศัลยกรรมลดการกดทับเส้นประสาทของโรคปวดใบหน้าในผู้ป่วยไทย*

วัสดุและวิธีการ: *ทบทวนข้อมูลจากเวชระเบียนของผู้ป่วยโรคปวดใบหน้าในผู้ป่วยไทยที่ได้รับการรักษาด้วยการผ่าตัดลดการกดทับต่อเส้นประสาท ที่หน่วยประสาทศัลยศาสตร์ ภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล และโรงพยาบาลรามคำแหง ระหว่างปี พ.ศ. 2544 ถึง พ.ศ. 2549 โดยศึกษาข้อมูลย้อนหลังของผู้ป่วยจำนวน 99 ราย ได้วิเคราะห์ข้อมูลโดยอาศัยตัวทดสอบ สจ๊วต-แมกซ์เวล*

ผลการศึกษา: *โดยทบทวนข้อมูลจากเวชระเบียนของผู้ป่วยโรคปวดใบหน้าในผู้ป่วยไทยจำนวน 99 ราย ในช่วงเวลาระหว่างปี พ.ศ. 2544 ถึง พ.ศ. 2549 รวบรวมผู้ป่วย 38 ราย (ร้อยละ 38.4) จากโรงพยาบาลรามคำแหง และ 61 ราย (ร้อยละ 61.6) จากหน่วยประสาทศัลยศาสตร์ ภาควิชาศัลยศาสตร์ คณะแพทยศาสตร์ โรงพยาบาลรามาธิบดี มหาวิทยาลัยมหิดล ผลการศึกษาพบว่าร้อยละ 97.9 ของผู้ป่วยทั้งหมดหายปวดใบหน้าหลังการรักษาด้วยการผ่าตัด และติดตามต่อไปในช่วงระยะเวลา 5 ปี อย่างมีนัยสำคัญเมื่อเปรียบเทียบกับก่อนการรักษา ($p<0.001$) นอกจากนี้ยังพบในผู้ป่วยเพศหญิง (ร้อยละ 75.6) มากกว่าในเพศชาย (ร้อยละ 24.4) ผู้ป่วยส่วนใหญ่มีอาการที่ใบหน้าด้านขวา (ร้อยละ 72.8) มากกว่าด้านซ้าย (ร้อยละ 27.2) ร้อยละ 78.8 ของผู้ป่วยทั้งหมดมีอาการปวดใบหน้าที่บริเวณเส้นประสาทใบหน้าแขนงที่สาม ร้อยละ 19.2 ของผู้ป่วยทั้งหมดมีอาการปวดใบหน้าที่บริเวณเส้นประสาทใบหน้าแขนงที่สอง ร้อยละ 30 ของผู้ป่วยทั้งหมดมีอาการปวดใบหน้าที่บริเวณเส้นประสาทใบหน้าทั้งแขนงที่สองและสาม ร้อยละ 2 ของผู้ป่วยทั้งหมดมีอาการปวดใบหน้าที่บริเวณเส้นประสาทใบหน้าทั้งสามแขนง ร้อยละ 65.7 ของผู้ป่วยทั้งหมดรายงานว่ามีตำแหน่งกดเจ็บ*

สรุป: *การศึกษาพบว่าผู้ป่วยทั้งหมดมีอาการปวดใบหน้าที่บริเวณเส้นประสาทใบหน้าแขนงที่สาม ซึ่งสอดคล้องกับการศึกษาในต่างประเทศ การรักษาโดยการผ่าตัดเป็นการรักษาที่ยอมรับเป็นมาตรฐาน และร้อยละ 97.9 ของผู้ป่วยทั้งหมดหายปวดใบหน้าหลังการรักษาด้วยการผ่าตัด*
