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Frey's syndrome: A study in the Thai population*

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Objective : *To study the incidence and characteristics of Frey's syndrome in the Thai population*

Setting : *Division of Plastic and Reconstructive Surgery, Department of Surgery, King Chulalongkorn Memorial Hospital*

Design : *Descriptive retrospective study*

Subjects : *41 patients who presented with a clinically benign parotid mass and underwent standard superficial parotidectomy at King Chulalongkorn Memorial Hospital during the nine year period from1983 to1991*

Methods : *The medical records of all of the patients were reviewed. Twenty- three patients returned for special follow up. At this time post operative evaluation for Frey's syndrome and other complications was performed, involving a subjective personal interview that placed emphasis on subjective symptoms of gustatory sweating and flushing, perceptions of post operative cosmetic appearance and cheek contour, sensation at the operative site, scar quality and facial asymmetry. Objective evidence of aberrant nerve regeneration was provided by Minor's starch testing*

Results : *Personal interviews identified Frey's syndrome in twelve of twenty-five cases(48 per cent), five of these twelve cases (20 per cent) also identified a flushing reflex. Minor's starch iodine tests identified eighteen of twenty-five lesions (72 per cent) with objective evidence of aberrant nerve regeneration. Of note, six of these eighteen patients were asymptomatic.*

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Conclusion : *This study has confirmed that standard superficial parotidectomy in Thai population is complicated by a high incidence of Frey's syndrome.*

Key words : *Frey's syndrome, Thai population.*

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วัตถุประสงค์ : *เพื่อศึกษาอุบัติการณ์และลักษณะเฉพาะของ Frey's syndrome ในกลุ่มประชากรไทย*

สถานที่ทำการศึกษา : *หน่วยศัลยศาสตร์ตกแต่งและเสริมสร้าง ภาควิชาศัลยศาสตร์ โรงพยาบาลจุฬาลงกรณ์*

รูปแบบการศึกษา : *การศึกษาเชิงพรรณาแบบย้อนหลัง*

กลุ่มที่ทำการศึกษา : *ผู้ป่วยที่ป่วยด้วยเนื้องอกของต่อมน้ำลาย parotid ที่ไม่ใช่มะเร็ง ซึ่งได้รับการผ่าตัดด้วยวิธี standard superficial parotidectomy ในโรงพยาบาลจุฬาลงกรณ์ ในช่วงเวลา 9 ปี ระหว่างปี พ.ศ.2526 ถึง พ.ศ.2534*

วิธีทำการศึกษา : *จากผู้ป่วยทั้งหมด 41 คนที่ได้รับการผ่าตัด ได้ทำการรวบรวมรายละเอียดทั้งหมดและในจำนวนนี้มีผู้ป่วยจำนวน 23 คน สามารถติดตามกลับมาเพื่อซักประวัติและทำการตรวจร่างกาย การซักประวัติจะเน้นถึงอาการของ Frey's syndrome คือเมื่อรับประทานอาหารที่มีรสจัดจะมีเหงื่อออกที่บริเวณที่ทำการผ่าตัดหรือมีผื่นแดงขึ้นในบริเวณดังกล่าว รวมทั้งซักถามถึงอาการแทรกซ้อนอื่น ๆ การตรวจร่างกายจะเน้นถึงความผิดปกติต่าง ๆ ที่พบได้หลังการผ่าตัด นอกจากนี้ยังทำการทดสอบเพื่อเป็น objective evidence โดยการทำ Minor's starch iodine test*

ผลการศึกษา : *จากการซักถามผู้ป่วยพบผู้ป่วย 12 รายจาก 25 รายที่มีอาการเหงื่อออกเมื่อทานอาหารรสจัด (48 เปอร์เซ็นต์) ใน 12 คนนี้พบว่ามีผู้ป่วย 5 คน ที่พบผื่นแดงด้วย (20 เปอร์เซ็นต์) Minor's starch iodine test ตรวจพบผลเป็นบวก 18 คน (72 เปอร์เซ็นต์) ในจำนวน 18 คนนี้ผู้ป่วย 6 คนไม่เคย สังเกตว่ามีอาการ*

สรุป : *เราพบว่าอุบัติการณ์ของ Frey's syndromeในประชากรไทย หลังทำผ่าตัด standard superficial parotidectomy นั้นยังสูงอยู่*

คำสำคัญ : *ประชากรไทย, Frey's syndrome*

The classic report from which the syndrome derived its name was made in 1923 by Frey. Almost all of the recent studies about Frey's syndrome have been confined to Caucasian populations. Although the difference between Oriental and Caucasian skin structure has been documented, this study has confirmed that standard superficial parotidectomy in the Thai population is also complicated by a high incidence of Frey's syndrome.

Frey's syndrome, also known as the auriculo-temporal syndrome, is characterized by gustatory sweating, with or without a red flush in the skin overlying the site of operation. The number of patients who complain of disturbing or embarrassing symptoms from Frey's syndrome is relatively low; however Frey's syndrome is a more common sequel to parotid surgery than is generally appreciated.[1-3]

Table 1. Patient data 1983 – 1991.

All Cases	41
All Operation	43
Reviewed Cases	23
Reviewed Operation	25
Female/Male (n = 41)	18:23
Mean Age (year : n = 41)	48
Side of Lesion	
Left / Right	22/19
Bilateral	2
Post-operative Follow-up	
(month, n = 25)	
Mean	64
Range	17-112

Figure 1. Surgical site of standard superficial parotidectomy (A) Intraoperative field (B) Immediate post operative site; the optional modified rhytidectomy incision with an extension of incision down the neck was demonstrated.

Material and Methods

All patients who presented with a clinically benign parotid mass (Table 1.) and underwent parotid gland surgery at King Chulalongkorn Memorial Hospital during the nine year period from1983 to1991 were reviewed. Forty-three standard superficial parotidectomies were performed in the forty-one patients, with bilateral lesions in two of the patients. A modified rhytidectomy incision with an optional extension of the incision down the neck was used for additional exposure as needed. (Figure 1.)

A benign mixed tumor (Pleomorphic adenoma) comprised the majority of the lesions. (Table 2.) Patients with malignant lesions that required further treatment were excluded from this study. Eighteen patients proved to be untraceable. Twenty- three patients returned for special follow up. At this time,

Table 2. Parotid Pathology (n = 43).

Tumors	
Benign mixed tumor	23
Warthin's tumor	6
Monomorphic adenoma	3
(1 papilloma, 2 tubular)	
Acinic cell tumor	2
Myxoma	1
Lipoma	1
Other lesions	
Sialosis	5
Hyperplasia	2
Total	43

Figure 2. Lateral views of preauricular region in asymptomaic Minor's starch iodine test-negative patient; operated side (A), nonoperted side (B).

post operative evaluation for Frey's syndrome and other complications was performed, involving a subjective personal interview that placed emphasis on subjective symptoms of gustatory sweating and flushing, perceptions of post operative cosmetic appearance and cheek contour, sensation at the operative site, scar quality and facial asymmetry. Objective evidence of aberrant nerve regeneration was provided by Minor's starch testing (n = 25) [4] Minor's test involves painting the skin of the head and neck with a solution made up of 3 gm. Iodine, 20gm. castor oil, and 200 ml alcohol. The area was dusted with cassava starch powder. The patient was asked to drink pure lemon juice with a tart citrus fruit candy.[5] After 2 minutes, each cheek was examined and photographed. Dark blue spots indicated a positive Minor's starch iodine test. (Figure 2,3)

Result

Personal interviews identified Frey's syndrome in twelve of twenty-five cases (48 percent), five of these twelve cases (20 percent) also identified flushing reflex (Table 3). None of these patients reported socially embarrassing or distressing symptoms of gustatory sweating and flushing. Most Frey's syndrome symptoms had developed within 3 months of surgery, excepting two of these patients who noticed these symptoms 2 years after the operation.

Although eighteen patients were untraceable, all their medical records in which all of them were less than six weeks since the surgerys were reviewed. The records had shown signs and symptoms of Frey's syndrome in some of these patients.

Minor's starch iodine tests identified eighteen of twenty-five lesions (72 percent) with objective

Figure 3. Lateral views of preauricular region in symptomatic Minor's starch iodine test-positive patient; operated side (A), nonoperted side (B).

Table 3. Incidence of Frey's syndrome.

Gustatory sweating reflex	n (25)	per cent
(Subjective)		
Positive	12	48
Male/Female	9:3	
Negative	13	52
Flushing reflex		
(Subjective and Objective)		
Positive	5	20
Male/Female	2:3	
Negative	20	80

evidence of aberrant nerve regeneration.(Table 4) Of note, six of these eighteen patients were asymptomatic. One recurrent case of benign mixed tumor was observed.

Table 4. Result of Minor's test.

Minor's starch iodine test	N(25)	Per cent
Positive	18	72
Subjective positive	12	
Subjective negative	6	
Negative	7	28

Table 5. Area of decreased sensation.

Mastoid area	2
Ear lobule	10
Surgical scar and earlobule	4
Total	16

Table 6. Scar quality (n = 25)

Good (fine-well hidden scar)	20
Medium (mild ear lobule displaced or mild hypertrophic scar)	5

Most patients were unaware of cheek contour deformities and were satisfied with the appearance and symmetry of their faces. Physical examination demonstrated some decrease in sensation at the operative site (Table 5) and most of the scar was well-hidden (Table 6), (Figure 4). Four patients had developed a transient facial paresis postoperatively. Two patients had developed permanent mild weakness of depressor anguli oris function in full facial emotional expression but neither was aware of it (Figure 5). One patient had developed hematoma and two patients had developed seroma collections. One patient had developed a superficial necrosis of the skin at the mastoid area.

Discussion

Frey's syndrome is characterized by gustatory sweating, with or without a red flush in the overlying skin after parotid surgery.[1-3]

The exact cause of Frey's syndrome remains unknown. Several theories have been postulated. However, the most commonly accepted theory is aberrant nerve regeneration of cholinergic fibers from the auriculotemporal nerve that are divided during parotid surgery.[6-8] Normally, the auriculotemporal nerve contains afferent sensory fibers from the skin and efferent fibers both to the skin and the parotid gland. The efferent fibers include secretory post ganglionic (cholinergic) parasympathetic fibers to the parotid gland, parasympathetic vasodilatation fibers to the parotid gland, secretory post ganglionic (functionally cholinergic) sympathetic fibers to the sweat glands and sympathetic vasodilatory fibers to the subcutaneous vessels.[9]

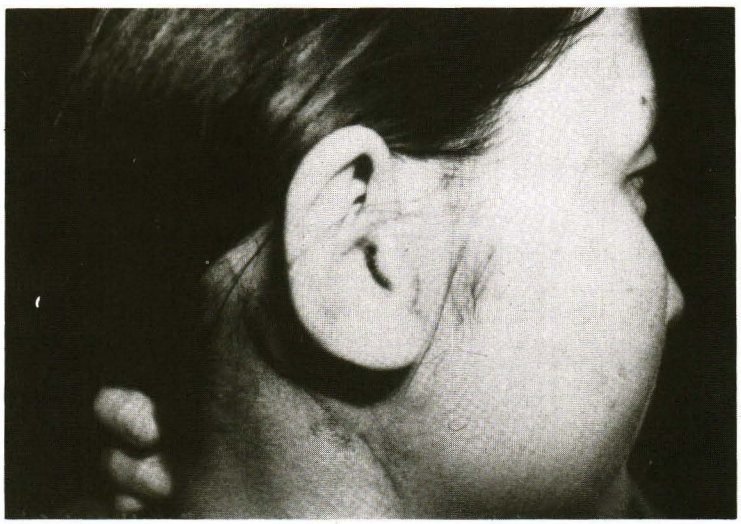

Figure 4. Preauricular contour seen after standard superficial parotidectomy.

Many of these fibers are severed during parotidectomy. Post operative sprouting and regeneration of parasympathetic fibers are believed to aberrantly reinnervate the sweat glands of the overlying cheek skin. This post operative cross reinnervation is responsible for gustatory sweating and flushing when the parasympathetic fibers of the auriculotemporal nerve are stimulated as part of the normal gustatory reflex.

Figure 5. Normal fullfacial expression found after benign parotid surgery.

Since Madame Lucie Frey published her work in August 1923 - a case of "Le syndrome du nerf auriculotemporal",[1] a large number of reports have noted the incidence of Frey's syndrome after parotid surgery to vary widely between 11 % and 100 %.[7,10-12] However, almost all of these reports were based on Caucasian patients.[1-12] Since the different in anatomy and histology of skin between Caucasian and Oriental population had been documented,[13-16] this study was undertaken to reveal the incidence of Frey's syndrome after benign parotid surgery in the Thai population.

We have demonstrated that the incidence of Frey's syndrome in our series is twelve of twenty-five (48 per cent). However the Minor's starch iodine tests were 72 per cent positive. Most Frey's syndrome developed within 3 months after surgery. In the

untraceable patients, eventhough we had found that the incidence of Frey's syndrome in their medical records was close to this study, we did not include them in this study because all their follow up medical records were less than six weeks. No spontaneously resolved case was found during the post operative follow up mean of 64 months (range 17-112 months). This study has confirmed that standard superficial parotidectomy in Thai population is complicated by a high incidence of Frey's syndrome. Fortunately most of these patients did not feel socially embarrassing or distressing symptoms of gustaory sweating and flushing . Any surgical technique that could prevent or lower the incidence of Frey's syndrome should be considered in standard superficial parotidectomy.

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