

## IDIOPATHIC UNILATERAL MASSETER MUSCLE HYPERTROPHY: CASE REPORT & REVIEW OF LITERATURE.

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### Abstract

Etiological manifestation of unilateral or bilateral hypertrophy of masseter muscle, is not clearly defined. It is thought to have a congenital combined with occlusion, psychogenic & neurophysiologic causes. The disease is clearly differentiated from other disease, however careful distinction for the parotid disease is necessary due to its location. The patients mainly complain aesthetic problems, surgical excision is the treatment of choice. Although no recurrence cases were reported, follow up for this is recommended.

### INTRODUCTION

Masseter Muscle Hypertrophy (MMH) may be unilateral or bilateral and affects both male and females.

The etiology of this abnormality is still obscure, but is a mixture of congenital, racial background, or work hypertrophy in bilateral cases, and acquired factors in unilateral cases.

Main complaints of these patients are aesthetic problems due to facial asymmetry or broad face, there may be pain or tension on muscle area.

Diagnosis of this abnormality is established based on clinical and radiological examinations. Treatment is either conservative or surgical.

Conservative therapy includes spasmolytic, tranquilizers and occlusal equilibration. (Harsh, 1946, Thoma, 1950).

Surgical technique may be either an extraoral (Gurney<sup>1)</sup> 1943, Adams<sup>2)</sup> 1949, Gelbke<sup>3)</sup> 1964, Ginwalla<sup>4)</sup> 1961) or intraoral approach (Ginestet<sup>5)</sup> et al 1959, Perko<sup>6)</sup> 1963, Converse<sup>7)</sup> 1964, Beckers<sup>8)</sup> 1977, Roncevic<sup>9)</sup> 1984).

The purpose of this paper is to report a rare case of masseter muscle hypertrophy, its etiology, diagnosis, and treatment.

### REPORT OF CASE

Case ; A 25-year-old man visited to our dept. for diagnosis and treatment of mass on Lt mandibular body & angle area.

#### History of present illness

He first noticed slowly growing mass on Lt mandibular body and angle area 10 years ago. There were no pain and tenderness.

Family history and past medical history was not contributory.

#### Physical, Radiologic & Laboratory examination.

The result of general physical examination were within normal limit except for facial asymmetry due to bulging on left mandibular angle area.

This enlargement revealed soft, non-tender, contractile and ill-defined, soft tissue mass with relaxation

of jaw, the mass was hanging in appearance, but on clenching or strong bite, it became more prominent & firm to palpation. On intraoral examination, no abnormal wear or facet wear seen.

No missing teeth were found and patient denied habit of unilateral chewing. TMJ examination was within normal limit.

Neuropsychiatric finding with "MMPI" was within normal limit. On plain x-ray film, no angular prominence or thinning of mandible or bony spur were seen. Ultrasonogram revealed hypertrophy of masseter muscle with ill-defined echogenicity, possible tumor mass was considered.

Sialography in parotid gland showed considerable lateral deviation of stenson's duct. Under the diagnosis of unilateral masseter muscle hypertrophy, surgical excision of hypertrophy muscle that troublesome to the Pt. was planned.

#### Hospital Course

Under the general nasoendotracheal anesthesia with halothane & N20-O2, Pt was prepared and draped in an usual manners.

Catheterization into stensen's duct was carried out to avoid possible injury to the structure during an operation. A Risdon approach was used and a skin incision was made 2cm below the border at the angle of mandibular area.

After the dissection of skin & subcutaneous tissue, superficial layer of cervical fascia was encountered and dissected superiorly.

From the area of inferior border of mandible, superficial cervical layer was divided & reflected. Buccal branch of facial nerve was identified at this plane and was retracted. After the exposure of bulging area of masseter muscle, excision was done at lower border of muscle as proposed by Dencer (Fig. 6).

Troublesome bleeding was noted but was controlled by pressure & tying. Muscle was sutured with medial periosteum at the mandible border under the coverage with muscle relaxant. The traction of muscle was not easy due to shortening of muscle length.

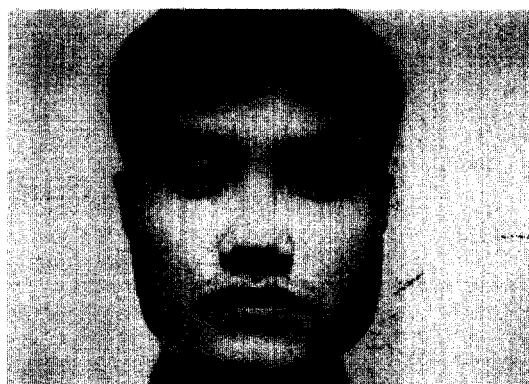


Fig. 1. Preoperative photography.



Fig. 2. Preoperative orthopantomography. No angular prominence or thinning of mandible or bony spur were seen.

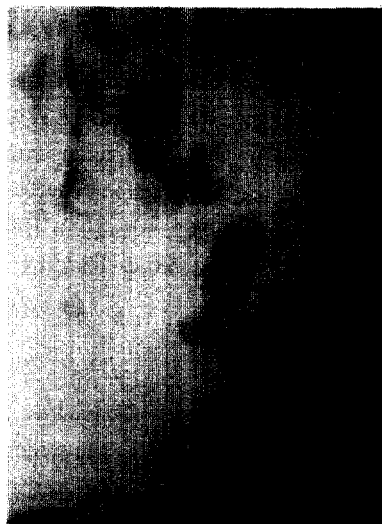


Fig. 3. Preoperative sialography in parotid gland. It is showed considerable lateral deviation of stensen's duct.

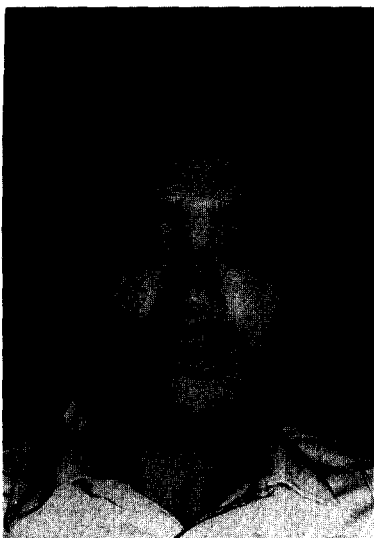


Fig. 4 Postoperative photography.

Wound was closed by layer to layer. No drain was inserted and pressure dressing was done. For 1 week postoperatively, Pt was recommended for mouth opening limitation and soft diet. Post-op. Course was uneventful.

The pathologic report stated that fragment of skeletal muscle with reparative change.

## DISCUSSION

Since Legg<sup>10</sup> first reported the idiopathic enlargement of masseter muscle in a girl aged 10 in 1880, Durox's<sup>11</sup> bilateral hypertrophy case in young man, in 1905. Bildt's<sup>12</sup> case of several unilateral involvement in 1930, and Gurney<sup>1</sup> in 1947, Adams<sup>2</sup> in 1949 and Tempest<sup>13</sup> in 1951 were reported. They were unilateral or bilateral.

### Etiology

Although all authors have agreed that etiology is unknown, bilateral hypertrophy is seen quite frequently and may be congenital or racial characteristic or may be a work hypertrophy. Unilateral cases is more difficult to explain.

Those who consider it to be acquired cite local

& neurogenic factors as causative factors. In 1947 Gurney<sup>1</sup> was the first to suggest that masseter muscle hypertrophy could be an example of "Work hypertrophy" resulting from clenching, bruxism, overacting of masticatory apparatus. This was accepted by many authors (Adams<sup>2</sup> 1949, Converse<sup>7</sup> 1964, Wade & Ray<sup>14</sup> 1971, Bunger<sup>15</sup> 1981). Other etiologic factors have been postulated such as loss of teeth, pain dental origin, unilateral chewing. Various disorder of occlusion and changes in temporomandibular joint. It is open stated that it is commonly presented in person under emotional tension, so same authous have paid attantion to jaw clenching (Hersh<sup>16</sup> 1946, Barton<sup>17</sup> 1957, Caldwell & Hughes<sup>18</sup> 1957).

Guggenheim & Cohen<sup>19</sup> (1961) claimed that certain neurotic factor deriving from the process of oral integration might also creat such pressure as to disturb the proprioceptive feed-back via the mesencephalic root of trigeminal nerve.

Good win et al<sup>20</sup> (1967) stated that MMH could be a congenital anomaly. Beckers<sup>8</sup> (1977) consider MMH to be a predispostion-induced deformity which may be triggered by indequate or traumatic function of stomatognathic system, so they may cause secondary morphologic of functional change in adjacent structure.

Reich's<sup>21</sup> concept of the role of selective attention of muscular tension as character defences seemed to offer a possible key to etiologic factor. Such altered tension play a significant role in the production of many obscure clinical state, especially of neuromuscular system. Plutechick<sup>22</sup> & Ellman<sup>23</sup> et al. Also have all attempted to bring our attention to the enormous importance of psychogenic muscle spasm due to tension.

### Clinical Findigs

This abnormality usually occurs in late adolescents or young adult, (while Beckers<sup>8</sup> (1977)) stated that the mean age was 30.9 years). Both sexes were involved. Familial hypertrophy of mandible which was

noted in childhood or early adult life, were bilateral was reported by P. Martinelli<sup>24)</sup> et al in 1987.

Boldt<sup>12)</sup>, first mentioned a positive history in both father and mother of 16 boy mole patient.

Drummond & McIntosh<sup>25)</sup> meanly mentioned the possibility of racial contribution.

#### General Appearance

The most casual inspection reveals striking enlargement of one or both jaw, the swelling extending near parotid gland.

This swelling increase in size and firmness when jaw clenched. Palpation may rarely reveal a firm, circumscribed mass which leading to suspect the neoplasia. The patient usually has a history of slowly growing mass over the ramus of mandible. Rarely there is a history of pain.

But Guggenheim<sup>19)</sup> reported some cases of temporal headache in his case. Sexual predominance is not confirmed.

#### Diagnosis

Unilateral hypertrophy is carefully evaluated because of the possibility of it's confusion with neoplasia of infective process of muscle or in parotid gland.

Other conditions that to be required for diffential-diagnosis include actual involvement of muscle with syphillis, tuberculosis, actinomycosis, cyst or tumor such as fibrosarcoma, rhabdomyosarcoma, angioma.

On the radiography, there may be a flaring of mandibular angle, bony spur at angle as described by Legg<sup>10)</sup>, Adams<sup>2)</sup>.

But Coffey<sup>26)</sup>, Tempest<sup>13)</sup> & Kern<sup>27)</sup> mention the absence of bony abnormality in their cases. Parotid sialogram reveals normal conditon but lateral deviation of Stensen's duct may be noted. Computed tomogram was also used by Branoin<sup>28)</sup> et al.

Electromyographic study usually reveal normal range or no asymmetry as in Radmilo's case. But in one patient of Maxwell & Waggoner's<sup>30)</sup> case exhibited delayed & weakened action of involved muscle compared with opposite side.

#### Histology

Histologic study of excised muscle has shown some difference in fiber size and surrounding tissue condition. Coffey<sup>26)</sup> reported that his case show some fibers thicker than normal. Gurney<sup>1)</sup> reported normal muscle with some edema, whereas Adams,reported only normal muscles. Maxwell & Waggoner<sup>30)</sup> reported normal muscle in involve side with abnormal EMG in same side.

#### Treatment

Treatment may be conservative and surgical. Conservative therapy, such as psychotherapy, medication and when indicated, the elimination of habit, spasm, or Gum chewing were the treatment of choice.

Various surgical approaches were designed and have their logical basis. Beckers<sup>8)</sup> (1977) postulated that excision of the inner layer of muscle may cause a change in the afferent reflex arc which may be followed by a modification in the afferent motor nerve system and this could explain why the relapse has not occurred.

From the neurophysiologic aspect, the hypothesis might have the theoretical basis, since the proprioceptors of muscle are situated close to the junction of muscle, Radmilo<sup>29)</sup>, Waggoner<sup>30)</sup>, Hankey used intraoral approach and removed inner layer of muscle. Most frequently encountered hazard was the facial nerve injury .

Considering this, Adams<sup>2)</sup> & Master's<sup>31)</sup> excised the portion of insertion of muscle along the mandibular bordr. This allows for the reduction bulk without shortening of muscle.

It is necessary to apply a compression bandage to the mandibular region in order to avoid dead space.

It helps to prevent edema of op site and also act as short term immobilization of jaw. After the removal of bandage, gradual mouth opening exercise is indicated. No case of relapse after surgical reduction of MMH has been described. However, Surgery does not remove the possible etiological disorders which are cited as possible cause of "work hypertrophy"

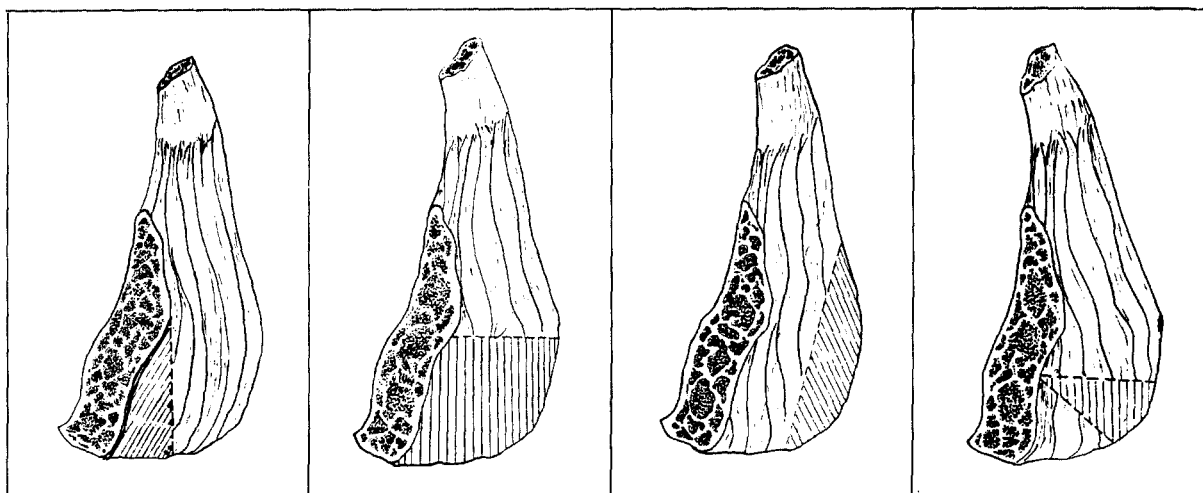


Fig. 5 Technique as described by Adams (schematic). Fig. 6 Technique as described by Dencer (schematic). Fig. 7 Technique as described by Gurney (schematic). Fig. 8 Technique as described by Wade (schematic).

of masseter muscle, or genetic origin, than possibility of recurrence is not to be ruled out.

## SUMMARY

We experienced the case of MMH and by reviewing the literature, we knew following

- 1) The etiologic factor is still obscure, but was proposed the possibility local, neurogenic and genetic factor.
- 2) Prevalent age is late adolescent or young adolescent or young adult except familial cases. No sexual predominance was confirmed.
- 3) Due to locational characteristics differential diagnosis with parotid disease offers some confusing.
- 4) Surgical excision is treatment of choice in consideration of possible recurrence.

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# 특발성 편측 교근비대증 : 증례보고 및 문헌고찰

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감별시는 부위적 특성으로 이하선 질환과의 구별이 요하나 임상적 및 방사선 검사에서 어렵지 않게 진단이 가능하며 치료로는 심미적인 문제로 인해 외과적인 절제가 최선의 치료이고 외과적 절제시에는 하악지의 형태에 대한 평가와 비후된 교근의 부위에 따른 적절한 수술법 선택이 요하며, 아직까지 재발에 관한 보고는 없으나 관찰이 요구된다.