

MANAGEMENT OF FACIAL NERVE PALSY CONSERVATIVELY AND SURGICALLY: A COMPARATIVE PROSPECTIVE STUDY

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Abstract

Background: The facial nerve has ischemia with vascular distension, inflammation, and oedema as the underlying pathophysiology seen in Bell's palsy instances. Numerous causes, such as viral, inflammatory, autoimmune, and vascular, have been suggested. The study was done with the purpose to compare outcomes of surgical and conservative methods in the treatment of facial nerve palsy. **Materials and Methods:** A prospective observational study on 60 patients, who reported with facial nerve palsy over the course of a year, from January 2021 to July 2022, was conducted in the department of ENT at a tertiary hospital, Telangana. Patients were assessed using the House-Brackman scale (HBS), and data on incidence, accompanying symptoms and recovery rates. **Result:** The mean age in the present study was 35.07±16.51 years consisting of 47 males and 13 females. Among the subjects the major cause was due to trauma followed by ASOM and CSOM. Majority of the subjects had complete degeneration. The recovery was immediate in majority of the subjects with the maximum being up to 8 weeks. **Conclusion:** A sizable portion of individuals entirely recovered from the disease both surgically and conservatively.

INTRODUCTION

The facial nerve winds around the temporal bone in an awkward way. It travels a long way through the fallopian canal, a bony channel. As a result, it is more vulnerable to damage than other bodily nerves. The most frequent cause of facial paralysis is intra temporal lesions. The quality of life is negatively impacted by facial nerve dysfunction on a physical, functional, and psychological level. Therefore, early assessment and management are required.^[1]Idiopathic, temporal bone fractures, infections like otitis media (acute and chronic otitis media, TB), tumours, congenital, iatrogenic traumas, and autoimmune diseases like multiple sclerosis are among the many causes of facial palsy.^[2,3]Clinical signs of facial nerve paralysis, such as facial weakness, loss of taste, decreased tear and salivary secretion, are used to diagnose it.^[4,5]The external auditory canal, tympanic membrane, pure tone audiometry, and stapedia reflex must then be examined otoscopically. To identify the lesion's location, topo diagnostic tests are performed.^[6]Patients with facial nerve palsy should undergo radiological tests such as HRCTs to learn

more about the intratemporal section of the facial nerve and electrophysiological testing in trauma cases to learn more about the degree of dysfunction and chances for recovery.^[7]The severe effects of penetrating and traumatic head and neck trauma, as well as surgical injury- whether unintentional or brought on by tumour involvement—can include facial paralysis. Additionally, the aetiology is typically idiopathic in origin and has a wide range of potential causes, from viral to metabolic. There has been debate in the past on how to treat an injured intratemporal facial nerve. The field of reanimation of the paralyzed face is fascinating and constantly changing. Some people with cases of facial palsy improved after receiving conservative treatment. However, some individuals require surgery to treat edema and remove bone fragments that are pressing on the nerve. Hence this study was undertaken with the aim to outcomes of surgical and conservative methods in the treatment of facial nerve palsy.

Aim: To compare outcomes of surgical and conservative methods in the treatment of facial nerve palsy.

Objective: To assess post treatment outcome between conservatively and surgically treated groups.

MATERIALS AND METHODS

Study Design

Prospective study

Study period, place of study and duration

The study was conducted in the Department of E.N.T & Head and Neck Surgery, of a tertiary care hospital in Hyderabad, Telangana from January 2021 to July 2022.

Sample Size

The sample size has been estimated to be 60 patients fitting into the inclusion criteria within the study period.

Inclusion Criteria

1. Patients of both sexes and all age groups presenting with facial paralysis.
2. Patients who have given consent to be included in the study.

Exclusion Criteria

1. Patients presenting with bilateral facial palsies.
2. Patients presenting with facial palsy associated with congenital syndromes.
3. Patients who haven't given consent

Methodology

- Subjects who have been admitted under the Department of E.N.T & Head and Neck Surgery with facial palsy.
- Detailed history, demographic details, BMI, lifestyle history, drug history and other underlying conditions were recorded for all patients enrolled in the study.
- Facial nerve function was graded according to the House - Brackmen grading scale.
- Patients were categorized into patients treated by surgery and patients treated by conservative methods.
- Surgery was indicated in immediate facial nerve palsy (neuronal degeneration > 90% on ENog).
- Delayed paralysis or incomplete paresis was treated by conservative method.
- The following investigations were done and facial nerve palsy was mainly evaluated on basis of
 1. Clinical evaluation
 2. Nerve function study (Electroneuronography and Electromyography)
 3. House-Brackmann score

Statistical Analysis

- The collected data was entered into a MS excel sheet and analysis was done using the Statistical Package for Social Sciences software version 18.
- Descriptive statistics were employed to summarize the quantitative variables of demographic and

clinical data. Standard deviation was calculated as a measure of variation.

- Qualitative variables were expressed as percentages with 95% confidence interval.
- Differences in the mean values were tested for statistical significance employing student's t test/ Mann Whitney test in case of non-normal distribution.
- Similarly, to test for differences in the two proportions, Chi-square test/ Fisher's exact test was employed.
- Odd's ratio along with 95% confidence interval was estimated for various factors after dichotomizing the data.

Ethical Clearance

Ethical clearance was obtained prior to the initiation of the study. Each patient was adequately informed of the aims, methods, sources of funding, any possible conflicts of interest, and institutional affiliations of the researcher, the anticipated benefits and potential risks of the study and the discomfort it may entail to him/her and the remedies thereof.

RESULTS

[Table 1] shows the age distributions of the subjects were out of 60, 10 were <20 years, 22 between 21- 30 years, 11 were between 31- 40 years, 6 were between 41-50 years, 6 were between 51-60 years and 5 were > 60 years. The mean age in the present study was 35.07±16.51 years. [Table 2] shows the sex distribution of the subjects which consisted of 47 males and 13 females. Among the 60 subjects, 35 subjects had trauma, 3 subjects had ASOM, 7 subjects had CSOM, 6 subjects had MOE, 7 subjects had malignancy, 1 subject had TB and 1 subject had Herpes zoster [Table 3]. Among the 60 subjects, 35 subjects had facial palsy due to trauma and among them only 4 subjects had extratemporal fracture and the 31 subjects had fracture intratemporally. Labrynthine segment was involved in 1 subject, 1st genu in 4, tympanic part in 6, 2nd genu in 9 and mastoid segment in 10 subjects. Among all those with intratemporal injury, the fracture line was longitudinal [Table 4]. [Table 5] shows the ENog results among the 60 subjects with facial palsy. Majority i.e., 50 subjects had complete degeneration and the rest 10 subjects had partial degeneration. Among the 30 subjects in conservatively managed group, 19 subjects had immediate recovery, 3 recovered within 4 weeks, 5 recovered between 4 and 8 weeks and the rest 3 subjects had no recovery. Among the 30 subjects in surgically managed group, 13 subjects had recovery immediately, 6 recovered within 4 weeks, 4 recovered between 4 and 8 weeks, 1 subject took > 8 weeks and the rest 6 subjects had no recovery [Table 6]. Among the 30 subjects in conservatively managed group, 21 subjects had complete recovery, 6 had partial palsy and the rest 3 subjects had no recovery and had total palsy. Among

the 30 subjects in surgically managed group, 18 subjects had complete recovery, 6 had partial palsy

and the rest 6 subjects had no recovery and had total palsy. [Table 7].

Table 1: Distribution of subjects with facial palsy according to age

Age	Conservative Management	Surgical Management	Total
< 20 years	06 (20.0%)	04 (13.3%)	10 (16.7%)
21- 30 years	05 (16.7%)	17 (56.7%)	22 (36.7%)
31- 40 years	06 (20.0%)	05 (16.7%)	11 (18.3%)
41- 50 years	03 (10.0%)	03 (10.0%)	06 (10.0%)
51- 60 years	06 (20.0%)	0	06 (10.0%)
> 60 years	04 (13.3%)	01 (3.3%)	05 (8.3%)
Total	30 (100%)	30 (100%)	60 (100%)
Mean age	40.47±19.84 years	29.67±2.94 years	35.07±16.51 years

Table 2: Distribution of subjects with facial palsy according to sex

Sex	Conservative Management	Surgical Management	Total
Male	23 (76.7%)	24 (80.0%)	47 (78.3%)
Female	07 (23.3%)	06 (20.0%)	13 (21.7%)
Total	30 (100%)	30 (100%)	60 (100%)

Table 3: Distribution of subjects with facial palsy according to cause

Cause	Conservative Management	Surgical Management	Total
Trauma	16 (53.3%)	19 (63.3%)	35 (58.7%)
ASOM	01 (3.3%)	02 (6.7%)	03 (5.0%)
CSOM	04 (13.3%)	03 (10.0%)	07 (11.7%)
MOE	02 (6.7%)	04 (13.3%)	06 (10.0%)
Malignancy	07 (23.3%)	0	07 (11.7%)
TB	0	01 (3.3%)	01 (1.7%)
Herpes zoster	0	01 (3.3%)	01 (1.7%)
Total	30 (100%)	30 (100%)	60 (100%)

Table 4: Distribution of subjects with traumatic facial palsy according to level of injury

Level of injury	Conservative Management	Surgical Management	Total
Labrynthine segment	0	01 (5.3%)	01 (2.8%)
1st Genu	02 (12.5%)	02 (10.5%)	04 (11.4%)
Tympanic part	05 (31.3%)	01 (5.3%)	06 (17.1%)
2nd Genu	06 (37.5%)	03 (15.8%)	09 (25.7%)
Mastoid segment	02 (12.5%)	08 (47.3%)	10 (31.6%)
Extratemporal	01 (6.2%)	03 (15.8%)	04 (11.4%)
Total	16 (100%)	19 (100%)	35 (100%)

Table 5: Distribution of subjects with facial palsy according to ENoG results

ENoG results	Conservative Management	Surgical Management	Total
Complete degeneration	21 (70.0%)	29 (96.7%)	50 (83.3%)
Partial degeneration	09 (30.0%)	01 (3.3%)	10 (16.7%)
Total	30 (100%)	30 (100%)	60 (100%)

Table 6: Distribution of subjects with facial palsy according to period of recovery

Period of recovery	Conservative Management	Surgical Management	Total
Immediate	19 (63.3.0%)	13 (43.3%)	32 (53.3%)
< 4 weeks	03 (10.0%)	06 (20.0%)	09 (15.0%)
4 – 8 weeks	05 (16.7%)	04 (13.3%)	09 (15.0%)
> 8 weeks	0	01 (3.3%)	01 (1.7%)
Not recovered	03 (10.0%)	06 (20.0%)	09 (15.0%)
Total	30 (100%)	30 (100%)	60 (100%)

Table 7: Distribution of subjects with facial palsy according to outcome

Outcome	Conservative Management	Surgical Management	Total
Normal	21 (70.0%)	18 (60.0%)	39 (65.0%)
Partial palsy	06 (20.0%)	06 (20.0%)	12 (20.0%)
Total palsy	03 (10.0%)	06 (20.0%)	09 (15.0%)
Total	30 (100%)	30 (100%)	60 (100%)

DISCUSSION

The mean age in the present study was 29.67±2.94 years and consisted of 47 males and 13 females. Jin Kim et al,^[7] study reported the ages of the patients

with facial paralysis ranged between 19 and 74 years with an average age of 44 years. The male to female ratio was 1:1. Zainine R, et al,^[8] studied patients with Ramsay hunt syndrome and showed mean age was 46 years (range, 12—75yrs), 8 were men and 7 were

women. The study by Devang P.Gupta et al,^[9] reported 68% (34) were males and 32% (16) were females and prevalence of facial palsy was highest in the 4th decade which was 36%. The study by Ravikumar et al,^[10] findings showed that there were 14 female and 11 male patients in the age range 5-60 years.

The present study showed many of the subjects palsy due to trauma followed by ASOM, CSOM and MOE. The study by Devang P.Gupta et al,^[9] reported Fifty two percent (26) of the patients had facial palsy post trauma, out of which 76% (20) was due to post RTA leading to temporal bone fracture and 24% (6) was iatrogenic after performing modified radical mastoidectomy. Among other causes 40% (20) of patients had facial palsy as a complication of CSOM and 8% (4) had it due to squamous cell carcinoma. The study by Ravikumar et al,^[11] findings showed that 4 patients were with acoustic neuromas and had unsteadiness and 3 patients with complicated chronic otitis media had fever at the time of presentation.

In the current study 35 subjects had facial palsy due to trauma and among them only 4 subjects had extratemporal fracture and the 31 subjects had fracture intratemporally. Labrynthine segment was involved in 1 subject, 1st genu in 4, tympanic part in 6, 2nd genu in 9 and mastoid segment in 10 subjects. Among all those with intratemporal injury, the fracture line was longitudinal. Jin Kim et al,^[7] study reported the tympanic segment was the most common site of disease involvement in 38 patients (83%), and of these patients, 14 patients had exposure on the mastoid segment. Two patients had geniculate ganglion exposure, and two other patients had labyrinthine segment exposure. There was a large defect of the mastoid segment in four patients.

Among the 60 subjects at onset, 30 subjects had grade VI facial palsy according to the HB grading system, 17 subjects had grade IV, 7 subjects had grade III, 5 subjects had grade V and 1 subject had grade II facial palsy. The study by Devang P.Gupta et al,^[9] reported assessment of facial palsy was done according to House Brackmann (HB) grading and preoperatively 12% (6) patients were in grade II, 12% (6) in grade III, 48% (24) in grade IV and 28% (14) in grade V. The study by Ravikumar et al,^[10] findings reported earliest recovery was detected at 3 weeks in cases of Bell's palsy and longest recovery in patients who underwent hypoglossal facial anastomosis at 9 months to 1 year. All had complete recovery within 6 weeks. One case had no response at all on the affected side at 3 months after onset.

The present study showed among the 30 subjects in conservatively managed group, 21 subjects had complete recovery, 6 had partial palsy and the rest 3 subjects had no recovery and had total palsy. Among the 30 subjects in surgically managed group, 18 subjects had complete recovery, 6 had partial palsy and the rest 6 subjects had no recovery and had total palsy. On total among 60 subjects, 39 (65.0%)

subjects had complete recovery, 12 (20.0%) had partial palsy and the rest 09 (15.0%) subjects had no recovery and had total palsy.

Jin Kim et al,^[7] study reported the outcome of surgical intervention was closely related to the duration of onset to surgery. Longer durations can cause more severe deterioration of the facial nerve and poor surgical outcomes. The study by Redaelli de Zinis et al,^[11] reported normal facial function returned in all patients, The time of recovery varied from 2 weeks to 3 months, except for one patient who underwent mastoidectomy and in whom normal function returned in 10 months. The study by Devang P. Gupta et al,^[9] reported on the basis of the outcome observed, the recovery of satisfactory facial nerve function could be achieved, regardless of timing of surgery performed, within the first 3 months after the onset of paralysis.

CONCLUSION

Performing decompression surgery is recommended for the patients with immediate-onset facial palsy secondary to the temporal bone fracture in trauma with either partial or complete degeneration on electrophysiological tests is of prime importance and the appropriate time for decompression surgery is within the first 2 months following the trauma. It is therefore recommend having health systems which ensure early detection of facial palsy is done and effectively treated.

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