

Psychosocial Impact of Facial Paralysis Following Neck Dissection: A Literature Review

Arthur P. Gatti ¹, Matheus T. Ribeiro ², Flavio C. Hojaij ²

¹. Head and Neck Surgery, Federal University of São Paulo, São Paulo, BRA ². Surgery, Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, São Paulo, BRA

Corresponding author: Arthur P. Gatti, apgatti.ccp@gmail.com

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Abstract

Facial paralysis, a common complication of neck dissection due to facial nerve injuries, results not only in the loss of facial mimicry but also significantly affects patients' quality of life, particularly in terms of psychosocial perception - an aspect often overlooked by medical teams. This study aims to evaluate the psychosocial impact and perceptions of patients who developed lower third facial paralysis following marginal mandibular nerve injury during neck dissection. A total of 445 postoperative patients who underwent head and neck tumor resection with neck dissection were assessed, of which 217 experienced some degree of facial paralysis. The impact on quality of life varied depending on the assessment scale used, but most patients with lower third facial paralysis reported a reduction in their quality of life and negative effects on their perception of social inclusion. This paralysis, coupled with the stigma of cancer, leads to difficulties in understanding their societal role and concerns about how their social environment perceives them, particularly in social settings.

Categories: Anatomy, Physical Medicine & Rehabilitation, Oncology

Keywords: facial nerve paralysis, facial palsy, neck dissection, psychosocial impact, quality of life (qol)

Introduction And Background

The facial nerve, the seventh pair of cranial nerves, serves an exclusively motor function after passing through the stylomastoid foramen. It has five primary branches: temporal, zygomatic, buccal, marginal of the mandible, and cervical.

The surgical performance of neck dissection for treating metastases in head and neck surgery is a routine therapeutic approach for cancer management [1,2]. Advances in this technique have enhanced patient safety, reducing the risks of functional sequelae while preserving the oncological principles of the procedure [2-4].

Studies on complications arising from neck dissection describe injuries to the marginal nerve of the mandible, a branch of the facial nerve, as one of the most common sequelae of this procedure. Although these injuries are not life-threatening, they can compromise the patient's quality of life and negatively affect health perception [1-7]. Anatomical variations of this nerve, coupled with the lack of an objective reference point for its location, often complicate its identification during surgery. This difficulty or even the effort to locate the structure can result in temporary or permanent injury, causing paralysis of the facial muscles responsible for mouth corner movement [4,8,9].

Such injuries are reported in approximately 7.3-16% of neck dissection cases, particularly when lymph nodes in levels I and II are involved. However, these figures may be underestimated as data often come from retrospective studies [1,2]. Since surgeons typically focus on oncological outcomes, these consequences tend to be underestimated during follow-up, and their impact on patients' lives is frequently overlooked [2,5,7].

Despite patients often reporting neuropraxia of the mandibular branch in routine consultations, the psychosocial effects and quality of life implications of this complication remain underexplored in the medical literature [2,3]. Therefore, it is crucial to evaluate whether the patient's perception of lower third facial paralysis indeed detracts from their quality of life and has a psychosocial impact on their daily routine.

Review

Materials and methods

A literature review was conducted using the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) reporting guidelines (Figure 1) through PubMed, BVS, and SciELO, incorporating the following descriptors: "neck dissection," "facial palsy," "marginal mandibular nerve injuries," "life change

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events,” and “psychology.” Initially, 28 articles from 1981 to 2023 were selected. Articles that did not address nonneoplastic surgical aspects or involved peripheral neurological injuries unrelated to the surgical procedure (e.g., inflammatory, infectious, or rheumatological causes) were excluded. Of the 28 articles, 24 were excluded based on these criteria to avoid bias in analyzing nerve injuries and their associated postoperative psychosocial impact.

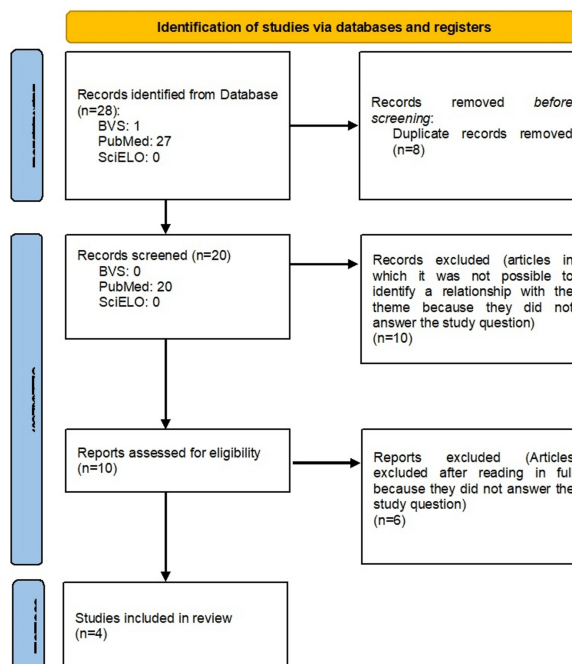


FIGURE 1: PRISMA flowchart

PRISMA, Preferred Reporting Items for Systematic reviews and Meta-Analyses

Among the four selected articles, a total of 445 patients were analyzed, of whom 217 had undergone head and neck tumor resection. Psychological and social factors were assessed using various scales to evaluate patient perception and the impact of facial paralysis on quality of life.

Results

Of the 445 patients analyzed, 217 were selected for having undergone surgeries for tumor resection in the head and neck, experiencing some degree of quality of life loss related to lower third facial paralysis [2,10-12]. All reviewed articles utilized the House-Brackmann scale for the initial classification of facial paralysis severity (Table 1). The studies employed various scales to assess the perceived impact on quality of life, including the Likert Scale (Figure 2), the University of Washington Quality of Life (UWQOL) Scale (Table 2), institutional prompt questions (Table 3), the Sydney and Sunnybrook systems (Figure 3), and Ekman's primary emotions (Figure 4) [2,10-17].

House-Brackmann Facial Nerve Grading System
Grade I - Normal
Normal facial function in all areas
Grade II - Slight Dysfunction
Gross: slight weakness noticeable on close inspection; may have very slight synkinesis
At rest: normal symmetry and tone
Motion: forehead = moderate to good function; eye = complete closure with minimum effort; mouth = slight asymmetry
Grade III - Moderate Dysfunction
Gross: obvious but not disfiguring difference between two sides; noticeable but not severe synkinesis, contracture, and/or hemifacial spasm
At rest: normal symmetry and tone
Motion: forehead = slight to moderate movement; eye = complete closure with effort; mouth = slightly weak with maximum effort
Grade IV - Moderate Severe Dysfunction
Gross: obvious weakness and/or disfiguring asymmetry
At rest: normal symmetry and tone
Motion: forehead = none; eye = incomplete closure; mouth = asymmetric with maximum effort
Grade V - Severe Dysfunction
Gross: only barely perceptive motion
At rest: asymmetry
Motion: forehead = none; eye = incomplete closure; mouth = slight movement
Grade VI - Total Paralysis
No movement

TABLE 1: House-Brackmann facial nerve grading system

Adapted from House and Brackmann (1985) [13]

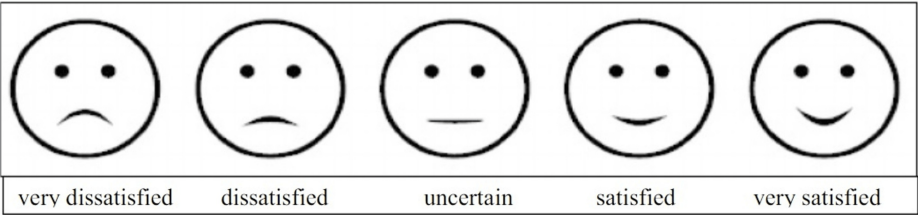


FIGURE 2: Five-point Likert scale

Adapted from Pieralli et al. (2017) [14]

The Head and Neck Symptom Scale of the UWQOL Questionnaire (UWQOL - RTOG Modification)	
Each of the following items lists different numbered statements. Think about what each statement says, then place a circle around the one statement that most closely describes how you have been feeling during the past week, including today. Please encircle only one statement for each item.	
1. PAIN	B. Swallowing
A. General	10 I swallow normally.

10 I have no pain.

20 There is mild pain; no need for medication.

30 I have moderate pain -it requires regular medication (codeine or non-narcotic).

40 I have severe pain controlled only by narcotics.

50 I have severe pain, not controlled by medication.

B. Mouth

10 I have no pain in my mouth.

20 I have mild pain, but it is not affecting my eating.

30 I have moderate pain that is affecting my eating.

40 I have severe pain and need medication in order to eat.

50 I have severe pain and cannot eat with the medication.

C. Throat

10 I have no pain in my mouth.

20 I have mild pain, but it is not affecting my eating.

30 I have moderate pain that is affecting my eating.

40 I have severe pain and need medication in order to eat.

50 I have severe pain and cannot eat with the medication.

2. DISFIGUREMENT

10 There is no change in my appearance.

20 The change in my appearance is minor.

30 My appearance bothers me, but I remain active.

40 I feel significantly disfigured and limit my activities due to my appearance.

50 I cannot be with people due to my appearance.

3. ACTIVITY

10 I am as active as I have ever been.

20 There are times when I can't keep up my old pace, but not often.

30 I am often tired and have slowed down my activities, although I still get out.

40 I don't go out because I don't have the strength.

50 I am usually in bed or chair and don't leave home.

4. RECREATION/ENTRETEINMENT

10 There are no limitations to recreation at home or away from home.

20 There are a few things I can't do but still get out and enjoy life.

20 I cannot swallow certain solid foods.

30 I can only swallow soft foods.

40 I can only swallow liquid foods.

50 I cannot swallow.

7. SALIVA

A. Amount

10 I have a normal amount of saliva.

20 I have a mild loss of saliva.

30 I have a moderate loss of saliva.

40 I have a severe loss of saliva.

50 I have no saliva.

B. Consistency

10 My saliva has a normal consistency.

20 My saliva is slightly thicker.

30 My saliva is moderately thicker.

40 My saliva is extremely thicker.

50 I have saliva that dries in my mouth and/or on my lips.

8. TASTE

10 I have tasted food normally.

20 I can taste most food normally.

30 I can taste some foods normally.

40 I can taste few foods normally.

50 I cannot taste any foods normally.

9. SPEECH

10 My speech is the same as always.

20 I have difficulty saying some words, but I can be understood over the phone.

30 I have moderate difficulty saying some words, and I cannot use the phone.

40 Only my family and friends can understand me.

50 I cannot be understood.

10. MUCUS OR PHLEGM

A. Amount

10 I have a normal amount of mucus.

30 There are many times I wish I could get out more, but I'm not up to it.	20 I have a mild loss of mucus.
40 There are severe limitations to what I can do; mostly, I stay at home and watch TV.	30 I have a moderate loss of mucus.
50 I can't do anything enjoyable.	40 I have a severe loss of mucus.
5. EMPLOYMENT	50 I have no mucus.
10 I work full time.	B. Consistency
20 I have a part-time but permanent job.	10 My mucus has a normal consistency.
30 I only have occasional employment.	20 My mucus is slightly thicker.
40 I am unemployed.	30 My mucus is moderately thicker.
50 I am retired (circle one below):	40 My mucus is extremely thicker.
51 Not related to cancer treatment	50 I have no mucus.
52 Due to cancer treatment	Please describe any other issues (medical or nonmedical) that are important to your quality of life and have not been adequately addressed by our questions:
6. EATING	
A. Chewing	
10 I can chew as well as ever.	
20 I have slight difficulty chewing solid foods.	
30 I have moderate difficulty chewing solid foods.	
40 I can only chew soft foods.	
50 I cannot chew soft foods.	

TABLE 2: The Head and Neck Symptom Scale of the UWQOL (UWQOL - RTOG Modification)

UWQOL, University of Washington Quality of Life

Adapted from Pugh et al. (2017) [15]

Institutional prompt questions
1. What has been your experience of facial paralysis?
2. What aspect(s) of the paralysis has been most difficult to deal with, and why?
3. How have you managed to help the situation?
4. Are you satisfied with the help you have received so far?

TABLE 3: Institutional prompt questions of patient values and perceptions of facial nerve palsy

Adapted from Hasmat et al. (2023) [11]

Sunnybrook Facial Grading System

Resting Symmetry	Symmetry of Voluntary Movement	Synkinesis
Compared to normal side Eye (choose one only) normal 0 narrow 1 wide 1 eyelid surgery 1 Cheek (nose-labial fold) normal 0 absent 2 less pronounced 1 more pronounced 1 Mouth normal 0 corner dropped 1 corner pulled up/out 1 Total ☐ Resting symmetry score Total × 5 ☐	Degree of muscle EXCURSION compared to normal side Standard Expressions Forehead Wrinkle (FRO) 1 2 3 4 5 ☐ Gentle eye closure (OCS) 1 2 3 4 5 ☐ Open mouth smile (ZYG/RIS) 1 2 3 4 5 ☐ Snarl (LLA/LLS) 1 2 3 4 5 ☐ Lip Pucker (OOS/OOI) 1 2 3 4 5 ☐ Gross Asymmetry Severe Asymmetry Moderate Asymmetry Mild Asymmetry Normal Symmetry Total ☐ Voluntary movement score: Total × 4 ☐	Rate the degree of INVOLUNTARY MUSCLE CONTRACTION associated with each expression NONE: No synkinesis or mass movement MILD: Slight synkinesis MODERATE: Obvious but not distorting synkinesis SEVERE: Distorting synkinesis gross mass movement of several muscles 0 1 2 3 ☐ 0 1 2 3 ☐ 0 1 2 3 ☐ 0 1 2 3 ☐ 0 1 2 3 ☐ Synkinesis score: Total ☐
Patient's name _____ Dx _____ Date _____	Vol mov't score ☐ - Resting symmetry score ☐ - Synk score ☐ = Composite score ☐	

FIGURE 3: Sydney and Sunnybrook facial grading system

Adapted from Mizgajski and Morzy (2019) [16]

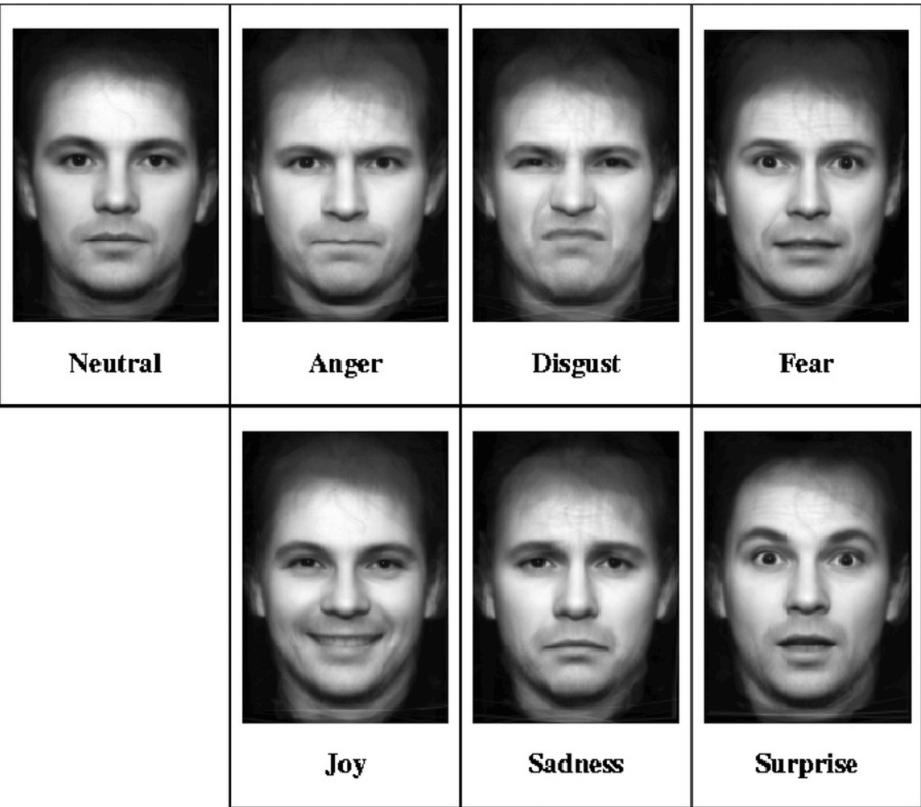


FIGURE 4: Ekman's primary emoticons scale

Adapted from Falih and Marrogy (2023) [17]

In the first article analyzed, among the 66 related patients (with 85 neck dissections performed), 18% initially exhibited some degree of facial paralysis according to the House-Brackmann scale. When assessed using the Likert Scale (Figure 2), 50% of the patients did not report any changes in facial motility, particularly regarding their smiles. Additionally, 41% experienced minimal limitations in motility, 5% reported a significant change that did not affect their quality of life, and 3% indicated that the impact was so severe that their disfigurement greatly affected their quality of life. Notably, no patient reported feeling unable to socialize after surgery [2].

In another article, following tumor resection surgery in 278 patients, 114 individuals (41%) reported some degree of psychological limitation due to facial paralysis, as measured by the UWQOL scale (score <75). Among these patients, 220 (79.13%) had undergone neck dissection related to their complaints about facial motility. Specifically, 50% had surgical manipulation at levels 3-4 (76 out of 153 patients), 41% (nine out of 22) had neck dissection at level 5, 38% (15 out of 39) underwent bilateral surgery, and 50% (three out of six) were treated with radical or modified radical neck dissection. The impact on the lower levels of the scale was not analyzed; instead, only the absolute number of patients experiencing a negative impact on their quality of life was reported [10].

In another study examining patient perceptions and values, a standardized institutional questionnaire (Table 2) was employed, which included five areas of analysis: (1) ocular symptoms; (2) fear of judgment and social isolation; (3) aversion to potential new invasive surgeries; (4) need for simplified multidisciplinary care; and (5) lack of public awareness. Among the 13 patients analyzed, seven reported complaints related to the oral site, while 12 experienced ocular complaints, with six indicating that ocular issues significantly impacted their quality of life. Additionally, 11 patients expressed concerns that their paralysis would adversely affect their social lives and public perception, particularly in the workplace. Seven patients were unwilling to undergo invasive facial surgeries again; however, all would accept minimally invasive options. Three patients indicated a need for multidisciplinary interventions, primarily group support therapies. Furthermore, four patients were unaware of the psychological impact that their treatment could have on their lives [11].

Another cross-sectional study analyzed 24 patients with facial paralysis following oncological surgical procedures, using both Ekman's primary emotions scale and the Likert scale. The study focused on the impact of facial motility on emotional expression and quality of life. Patients were asked whether their facial expressions accurately conveyed the emotions they intended to express - namely joy, displeasure, surprise, anger, sadness, and fear - according to Ekman's primary emotions scale. Among the participants, 11 patients (45%) reported difficulty expressing their feelings, with surprise being the most affected emotion (63.63%) [12,18]. When evaluating the Sydney and Sunnybrook systems, a significant difference was observed between the effective and non-effective patient groups concerning the expression of joy, surprise, and sadness. Patients reported challenges due to decreased movement (74%), synkinesis (48%), dissatisfaction with their facial appearance (13%), and asymmetry (3%) [12].

Discussion

The patient's perception of the impact on their quality of life is a topic that is underaddressed in the literature, with the number of publications significantly lacking considering the importance of the subject. Most studies concerning facial paralysis following surgical treatments in the head and neck - especially neck dissection - primarily focus on oncological outcomes, tumor recurrences, and adjuvant therapies [2,10]. The incidence of facial paralysis in the studied population is clearly underestimated, as it is often analyzed without standardized classification criteria, and the medical team may interpret aesthetic results differently than patients, who are more focused on therapeutic outcomes [11,12].

The prior understanding of both the patient and their family greatly influences how these individuals cope with the facial motor sequelae [5,19,20]. Some authors have noted that patients who developed facial paralysis after plastic procedures experienced better psychological outcomes when they received clearer explanations about their facial sequelae [20].

This study has a bias related to the varying scales used to analyze the impact of facial paralysis on patients' quality of life. The absence of a standardized framework complicates efforts for research centers to unify their evaluations, rendering real comparative analysis impossible. Nonetheless, it is feasible to extrapolate results and draw parallels to characterize this impact on the studied group, particularly at the extremes - those without changes in quality of life and those whose experiences hinder their social engagement [21].

The limitations in self-expression lead to a significant loss of quality of life, often isolating patients in their work and family environments, which can contribute to increased rates of depression and a higher risk of suicide [2,20,21]. This impact should be considered not only after the sequelae arise but also during the preoperative preparation of the patient, ideally with a multidisciplinary team to provide guidance.

Scales utilized in this study for grading paralysis, such as the House-Brackmann scale, along with scales for both subjective and objective evaluations of patients' perceptions of their facial motor complaints (including

the Likert Scale, UWQOL scale, Ekman's primary emotions, and the Sydney and Sunnybrook systems), have been validated for these purposes. These tools enable the care team to identify and address psychosocial disorders that may develop alongside the oncological treatment.

We found that the perception of lower third facial paralysis negatively impacts the quality of life of these patients, leading to loss of self-esteem and increasing feelings of social segregation. This situation disrupts fundamental family ties during their oncological treatment, diminishes their self-recognition as functional and social individuals, and reduces their acceptance of other therapeutic proposals.

Research examining the true psychological and social impact on individuals who endure not only the underlying disease but also the direct effects of surgical and adjuvant treatments is scarce in medical literature. Therefore, it is crucial to conduct more qualitative and quantitative analyses on this topic to enhance the level of care provided and optimize recovery for these patients, resulting in better quality-of-life outcomes.

Conclusions

Lower third facial paralysis secondary to injuries of the marginal nerve of the mandible during neck dissection surgery in oncological patients significantly impacts their quality of life, both during and after treatment. Approximately 50% of the analyzed patients who underwent this type of surgery reported some degree of motor complaint and psychosocial impact. Notably, 45% experienced difficulties in expressing feelings through facial mimicry, with 5% of these cases being severe. Although such injuries are common sequelae, they are often underestimated by healthcare professionals. The disfigurement perceived by these patients creates a negative impact on their self-esteem, affecting not only themselves but also their social circles.

The assessment of this impact can vary based on the patient's prior understanding and the extent of their paralysis. Various scales can be employed to measure this impact; however, the lack of standardization and the low recognition of this negative impact by care teams hinder the effective management of this sequela, exacerbating its effects on patients' lives.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Arthur P. Gatti, Matheus T. Ribeiro, Flavio C. Hojaij

Acquisition, analysis, or interpretation of data: Arthur P. Gatti, Matheus T. Ribeiro, Flavio C. Hojaij

Drafting of the manuscript: Arthur P. Gatti, Matheus T. Ribeiro, Flavio C. Hojaij

Critical review of the manuscript for important intellectual content: Arthur P. Gatti, Matheus T. Ribeiro, Flavio C. Hojaij

Supervision: Flavio C. Hojaij

Disclosures

Conflicts of interest: In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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