

A Likert Type Psychometric Scale to Assess the Temporomandibular Joint (TMJ) Function for Evaluation of Quality of Life (QoL) Following Total Joint Replacement Surgeries

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Abstract: There are various scales to assess pain, joint function, diet intake in patients having various temporomandibular joint (TMJ) disorders such as internal derangements and joint function following ankylosis release and reconstruction. But, there is no standard scale to assess the jaw function, diet intake assessment for patients diagnosed and treated for TMJ ankylosis and reconstructed with total alloplastic joint replacement. This article emphasizes on a proposal of a novel assessment scale to assess jaw function and diet intake in patients treated for TMJ ankylosis and reconstructed using total alloplastic temporomandibular joints. Although, proposed scales may be utilized for the treatment assessment, evaluation and follow-up in other temporomandibular joint disorders (TMDs)

Keywords: Temporomandibular Joint, Jaw Joint, joint disorders, ankylosis, Joint replacement.

INTRODUCTION

Temporomandibular Joint (TMJ) ankylosis is a complex problem managed by Oral and Maxillofacial Surgeons. The available literature about the assessment scale for subjective and objective symptoms is largely limited to fields other than TMJ disorders. Several studies have mentioned about assessment scales for various TMJ disorders. But, there is no standard assessment tool to evaluate the quality of life following TMJ total joint replacement (TJR) surgery for patients diagnosed with TMJ ankylosis to assess the jaw function and the diet intake consistency pre-operatively and post-operatively. We propose a reference scale for such patients to assess the treatment outcomes.

MATERIALS AND METHODS

An online search was done using two major indexing services- PubMed and Google Scholar with the search terms "Assessment scale for TMJ disorders", "TMJ ankylosis assessment", "Likert scale for TMJ", "VAS for TMJ disorders". The criteria for article selection was to include articles presenting scientific assessment scales for post-operative outcome and follow-up assessment for TMJ disorders. A total of 12 articles from the search had an assessment scale for TMJ disorders of which 6 articles (50%) [1-6] were considered appropriate and out of which 2 (16.66%) [5,

6] articles were selected that had a reference scale to assess the subjective and objective variables in patients who underwent TMJ TJR. But, the assessment scale in the 2 (16.66%) articles was found to have a lack of definition for each matrix to assess the various parameters in their study.

We propose a Likert type psychometric assessment scale to assess jaw function and diet in patients undergoing surgery for TMJ TJR reconstruction. The score value ranges from 1 – 10 to assess the jaw function and type of diet intake. If pain

parameter has to be assessed, a conventional 10 point Visual Analog Scale (VAS) can be added with the other proposed scores.

RESULTS

The scales used in the study by Kropmans TJ *et al.* [2] was classified as mastic and non-mastic scale to assess the various TMJ function with score ranging from 0 representing no difficulty to 4 meaning great difficulty. This can cause variation in results as patient perception and compliance differs in individual patients resulting in bias. Wolford LM *et al.* [6] used a Likert scale ranging from 0 – 10 to assess various parameters

in TMJ TJR patients. But the Likert scale lacked clarity as the scores were not assigned with any specifications. The scales used in other studies also lacked clarity. So in the present study, we have proposed a Likert scale with scores ranging from 1 to 10 to assess the jaw function and quality of diet intake with specifications for each scores incorporated. This can minimize bias as the patient and surgeon can accurately select a score that can be compared pre-operatively and post-operatively. (Table 1 and 2)

Psychometric Scale to assess Temporomandibular Joint Function (Likert Scale)

Table-1: Jaw Function Assessment

1	2	3	4	5	6	7	8	9	10
Normal movements (Ability to chew freely/Effortless chewing)			Minimal impairment in jaw function – Restricted protrusion movements (Can chew with minimal discomfort)				Severe Impairment (Can perform minimal protrusion/Strenuous chewing)		No movements

Table-2: Diet intake assessment

1	2	3	4	5	6	7	8	9	10
Ability to chew food of any consistency			Can chew solid foods with minimal discomfort				Difficulty in chewing solid foods. Can consume semi- solid foods with minimal discomfort		Only liquids

DISCUSSION

Kropmans TJ *et al.* [1] assessed reliability of pain assessment in patients with restricted TMJ using unidimensional Visual Analog Scale and multidimensional McGill pain questionnaire by means of generalizability of the patients diagnosed with restricted painful TMJ and to analyses the clinical utility of this method in individual patients. He concluded that the smallest detectable significant difference in measuring TMJ pain is relatively large. Pain assessment on a VAS is influenced by various internal and external factors to a greater extent than assessments of pain with a pain rating index.

Kropmans TJ *et al.* [2] in another study, assessed the reliability of impaired mandibular function using a questionnaire in patients with painfully restricted TMJ. It consisted of mastic scale to assess difficulty to chew soft, hard and resistant food. The non-mastic scale assessed non-masticatory activities like speaking and yawning. The answers were scored using a Likert scale with score ranging from 0 representing no difficulty to 4 being very great difficulty. They found that this was reliable in up to 20% patients with painful restricted TMJ.

Ohrbach R *et al.* [3] developed a Jaw Function Limitation Scale (JFLS). The overall initial score was from 0 – 10 which included variables such as

mastication and mobility. Score “0” was given no limitation and “10” as severe limitation. Score 11 to 20 represented verbal and emotional communication. They concluded that this tool is effective in assessing limitations in mastication, jaw mobility, verbal and emotional expression. But, the author has included patients not only with temporomandibular disorders (TMD) disorders but also with other disorders and control group.

Mercuri LG *et al.* [5] assessed patients who underwent TMJ TJR for subjective data of pain, mandibular function, diet consistency, and quality of life using a Visual Analog Scale (VAS) of 56 mm. He observed that there was improvement in pain, mandibular function, diet consistency and quality of life post-operatively measured using this scale. But, there was lack in clarity of the values of the VAS used.

Wolford LM *et al.* [6] in his study assessed the subjective and objective variables of patients who received TMJ total alloplastic replacement using a Likert scale to assess pain, jaw function and diet with score range from 0 – 10. The author has assigned 0 as normal jaw function with no pain and diet restriction. Score 10 corresponds to no jaw function with worse pain and intake of liquids only. The other scores were not assigned any specifications. The scale proposed in this study was similar to the Likert scale in the study by

Wolford LM et al. with specific parameters for every score for the assessment of jaw function and consistency of the diet intake.

CONCLUSION

This modified Likert psychometric assessment scale can be an effective tool to assess the jaw function and diet intake score with incorporation of VAS scale, where necessary, to assess the quality of life (QoL) in patients who undergo TMJ TJR surgery. Proposed scales may also be utilized for the treatment assessment, outcome evaluation and follow-up in other temporomandibular joint disorders (TMDs).

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