



PROGNOSIS REVISITED-AN ATTEMPT TO SOLVE THE CLINICAL DILEMMA

Missriya, Parimala Kumar, Thasneem AA, Manjushree Kadam, Zunaidha and Shreerashmi Nambiar

Department of Periodontics A.J Institute of Dental sciences Mangalore-575004

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ABSTRACT

Introduction: Periodontal therapy aims to prolong the lifespan of the dentition as preserving the natural dentition is the best option. The decision to retain a tooth is based on the local tooth related factors and the probability of long-term success of one or more treatment modality.

OBJECTIVE: This clinical case report provides an insight into a newer prognostic model proposed in 2015 by Martinez-Canut which considered five patient related and six tooth related factors to assess tooth loss due to periodontal disease in patients following periodontal maintenance.

Methodology:

1ST CASE: A 40 year old female patient in relation to 46, McGuire's Classification showed a poor prognosis, but the Martinez Canut Prediction model gave a score of 0.088 that implied good prognosis and a survival rate of 6-20 years.

2ND Case: A 52 year old female patient in relation to 46, McGuire's Classification showed a poor prognosis, but the Martinez Canut Prediction model gave a score of 0.110 that implied good prognosis and a survival rate of 6-20 years.

3RD Case: A 43 year old female patient in relation to 46, McGuire's Classification showed a poor prognosis, but the Martinez Canut Prediction model gave a score of 0.037 that implied good prognosis and a survival rate of 9-20 years.

Result: 1ST and 3rd CASE: Root canal treatment followed by periodontal surgery using a combination of bone graft and collagen membrane resulted in clinical and radiographic indication of periodontal healing.

2nd CASE: periodontal surgery using a combination of bone graft and collagen membrane resulted in clinical and radiographical indication of periodontal healing.

Conclusion: This prediction model needs to be followed as it gives a better prognosis than the existing model, where you can justify your treatment to the patient by explaining the model used which relies on mathematical formula and its not just subjective.

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INTRODUCTION

Establishing the prognosis of periodontally involved teeth is indeed very difficult. Various studies have found that it is very difficult to determine the exact prognosis of periodontally compromised teeth after their appropriate periodontal treatment.

The prognosis is a prediction of the probable, course, duration and outcome of a disease based on a general knowledge of the pathogenesis of the disease and presence of risk factors for the disease. It is established after the diagnosis is made and before the treatment plan is established. The prognosis is based on specific information about the disease and the manner in which it can be treated, but it also can be influenced by the clinicians previous experience with treatment outcomes (successes and failures) as they relate to the particular case.

In a series of study McGuire and Nunn (1991, 1996) concluded that it is difficult to predict the prognosis of teeth with an initial prognosis of less than good in other words it can be said that it is very difficult to establish an accurate

prognosis of periodontally compromised teeth. However, with accurate analysis of the periodontal condition, occlusion, systemic factors and patient motivation a predictable prognosis can be determined¹. Martinez Canut in 2018 introduced a prediction model to assign periodontal prognosis based on survival time. Perio project is the prediction model for tooth loss due to Periodontitis.

An algorithm calculates the probability of loss and survival expectancy of each tooth. This prediction model was developed by taking a systematic approach to model development and is a web based algorithm that can be openly accessed by researchers and clinicians. The tool calculates the probability of TLPD according to the impact of 11 predictors

Five Patient Related Factors

1. Age
2. Smoking habits. Positive if any more than 10/day
3. Signs and symptoms of bruxism
4. Severe periodontitis
5. Number of baseline teeth (excluded third molars maximum 28)

*Corresponding author: Missriya

A.J Institute of Dental Sciences Mangalore -575004

Six Tooth related Factors

6. Mobility
7. Probing pocket depth
8. Furcation lesion
9. Bone loss
10. Crown-root ratio
11. Type of tooth

This makes it possible to define the prognosis of the whole dentition based on survival expectancy, but more importantly, to retrospectively assess the accuracy of the prediction with any tooth extracted for periodontal reasons.

Case Reports

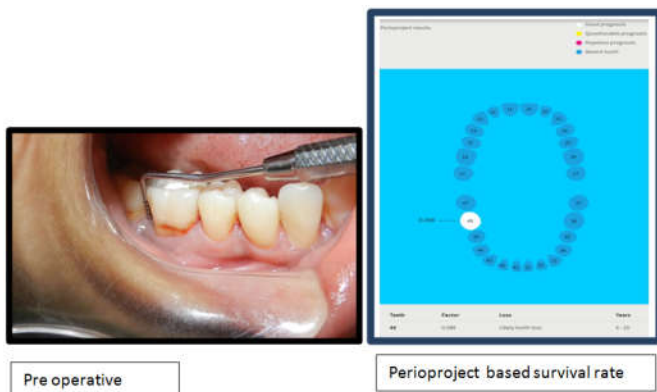
Case report 1

40 year old female patient reported to Department of Periodontics AJIDS Mangalore with chief complaint of pain in lower right back tooth region since few months.

Patient gave a history of dull aching pain and she was systemically healthy.

On clinical examination irt 46, there was Class 1 recession, Grade 2 Mobility, Grade 2 furcation involvement and probing pocket depth of 6mm.

According to Mcquirre and Nuns classification 46 has poor prognosis but Martinez canut prediction model, assigned longer survival rate i.e 6-20 years calculated based on patient related factors and tooth related factors.



Pre operative

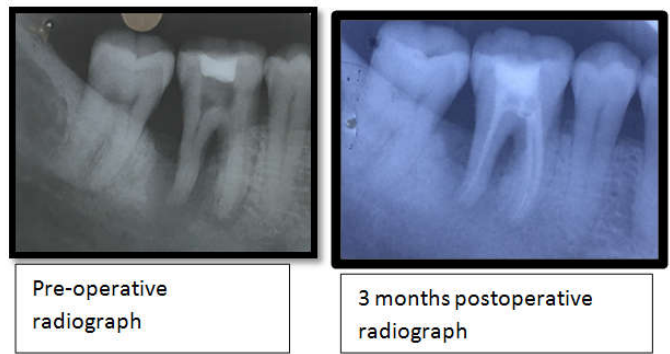
Perioproject based survival rate



Intrabony defect



Postoperative



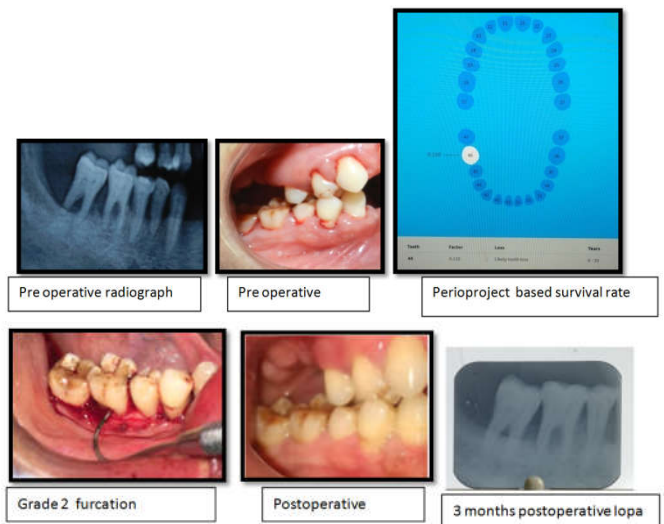
Pre-operative radiograph

3 months postoperative radiograph

Case report 2

Case report 2: 53 year old female patient reported to the Department of Periodontics with chief complaint of bleeding gums since two months. Patient was hypertensive since 5 years, on medication amlodipine. On clinically examination there was Drug induced gingival enlargement, Grade 1 mobility, Grade 2 furcation involvement, Probing Pocket depth: 8mm Angular defect irt 46.

According to Mcquirre and Nuns classification 46 has poor prognosis but Martinez canut prediction model, assigned longer survival rate i.e 6-20 years calculated based on patient related factors and tooth related factors



Pre operative radiograph

Pre operative

Perioproject based survival rate

Grade 2 furcation

Postoperative

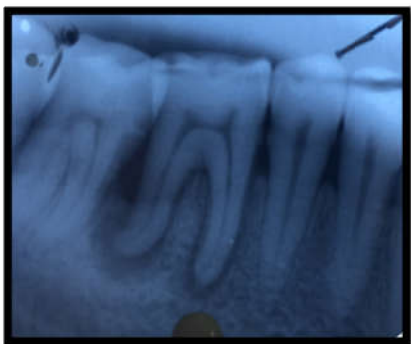
3 months postoperative lopa

Case Report 3

43 year old male patient reported to Department of Peridontics, with chief complaint of Pain in lower right back tooth region since one month. Personal history was Patient consumed pan 5-6 times a day since 20 years. Patient was systemically healthy.

On Clinical examination irt 46 Tender on percussion is positive, there was Grade II mobility, Pocket depth: 9mm (distal), Occlusal wear.

According to McQuirre and Nun classification, 46 had fair to poor prognosis but Martinez canut prediction model, assigned longer survival rate i.e 6-20 years calculated based on patient related factors and tooth related factors



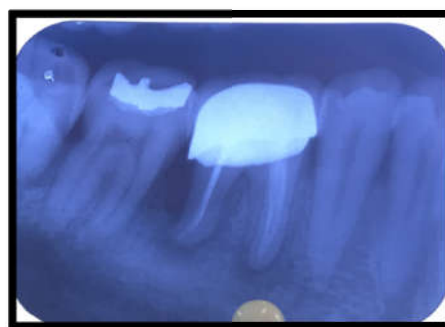
Preoperative radiograph



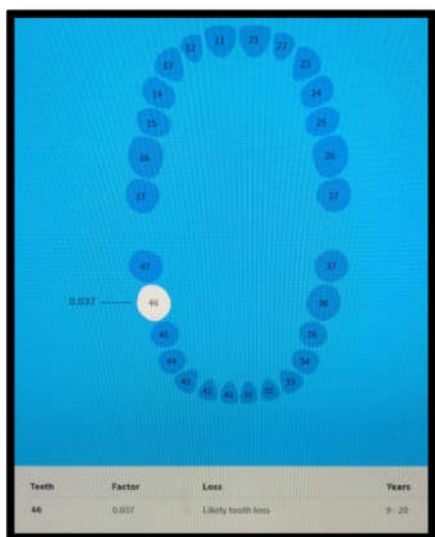
Barrier membrane placed



Preoperative



3 month postoperative radiograph



PerioProject based survival rate



Intrabony defect

DISCUSSION

Periodontal prognosis refers to the expected longevity of teeth with or without periodontal therapy. One can consider an overall prognosis for the dentition and also a prognosis for individual teeth. The concept of periodontal prognosis is an expression of the expected longevity of a tooth or an entire dentition and is useful for making decisions on whether to treat, retain, or remove periodontally involved teeth. Periodontal therapy aims to prolong the lifespan of the dentition, as preserving natural dentition is always the best treatment option⁴. Determination of prognosis is a dynamic process. It influences treatment planning directly. Categories used in indices are defined rather vaguely, and heterogeneous criteria are used. No single prognostic index has been unanimously accepted.

- McGuire and Nunn Classification(1996)³

Prognosis	One or More of the following for each category
Good	Control of the etiologic factors and enough clinical and radiographical periodontal support to enable the tooth to be maintained by the patient and clinician with proper maintenance.
Fair	Approximately 25% attachment loss, as measured clinically and radiographically, class1 furcation involvement. The severity of the furcation would allow adequate maintenance.
Poor	50% attachment loss and class2 furcations. The location and degree of the furcations would accommodate proper maintenance-although with difficulty.
Questionable	>50% attachment loss, poor crown/root ratio, class2(not easily accessed)or class3 furcation involvement, class2 mobility or more, Significant root proximity
Hopeless	Severe attachment loss, extraction performed or suggested.

- The tool calculates the probability of TLPD according to the impact of 11 predictors- associated with a certain survival time. Before mentioned 11 predictors are analysed by using the STATA software procedure.
- Multilevel analysis is performed to assess the impact of these predictors.

- Linear regression analysis is performed.

$$\frac{p_{ij}}{1-p_{ij}} = e^{\beta_0 + \beta_1 X_{1ij} + \beta_2 X_{2ij} + \dots + \beta_n X_{nij} + u_j + e_{ij}}$$

- There is a lack of a model that has specificity and sensitivity.
- This model presents high specificity and moderate sensitivity, with optimal calibration and discrimination measurements.
- It enables the definition of intervals of probability of tooth loss due to periodontal disease (TLPD) associated with survival time, so that based on the probability of TLPD, the survival time is accurately predicted.
- The actual usefulness of this prediction model, in daily practice, is two fold.
- It helps to assign a more accurate prognosis.
- The estimation of a certain survival rate, which has been accurate in 80% of cases in the study by Martinez Canut, represents an additional datum to incorporate in the routine process to assign periodontal prognosis.
- This model can be utilized as a master model, as it contains relevant and reliable information on predictors of TLPD that can be interpreted and applied by using the tool².

CONCLUSION

As De Van Muller stated “The preservation of that which remains is of utmost important than the meticulous replacement of lost teeth”. The Martinez Canut prediction model automatically depict the survival expectancy estimated at baseline which can verify how accurate the models prediction is which can be used to decide on the treatment plan .This prediction model needs to be followed as it gives a better prognosis than the existing model, where you can justify your treatment to the patient by explaining the model used which relies on mathematical formula and its not just subjective.

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