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ORIGINAL ARTICLE

# Evaluation of Certain Dentofacial Characteristics as Predisposing Factors in Patients with Myofacial Pain Dysfunction Syndrome

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**Abstract** Though a multifactorial etiology has been comprehensively documented in the literature over the years for temporomandibular joint (TMJ) disorder, none of the theories give a total explanation of all aspects of the syndrome. The aim of this study was to evaluate face form and certain occlusal parameters as relevant factors in the degree of dysfunction of the Temporomandibular joint. One hundred and three patients suffering from TMJ dysfunction attending the Out Patient Department of Dr R. Ahmed Dental College over a period of 2 years were clinically examined and subsequently tabulated and compared with the degree of dysfunction to analyze any correlation between them. The data were statistically analyzed by the student *t* test and $\chi^2$ test to assess the significance of the dysfunction in relation to the various parameters examined. The study indicated a positive relationship between the degree of dysfunction of the TMJ to the face form and certain other attributes.

**Keywords** TM Joint · Face-form · Dysfunction · Occlusion

## Introduction

The temporomandibular joint is one of the most complicated functional units of the human skeleton which bears a direct relation to the masticatory apparatus. Amongst the various disorders which affect the temporomandibular joint, Myofacial pain dysfunction syndrome is one of the most common yet poorly understood problems due to its multifactorial etiology. The syndrome is generally believed to be caused by an untoward interplay between the neuromusculature, psychology, temporomandibular joint and occlusion.

Since none of the theories gave a total explanation of all the aspects involved in the clinical picture of the syndrome, efforts have been put by various workers to find a cause and effect relationship of the same. That certain anatomic variations may predispose a patient to develop Myofacial pain dysfunction syndrome was suggested by Sickels and Ivey (1979) [1]. T.M. Graber [2] tried to relate bruxism associated with over-bite as a contributory factor for TMJ problems. V. Sassouni [3] in his classification of facial types stated that deep-bite patients have a square appearance from the frontal view and have strong masseter action. Correlating facial form with attrition A. Weinberger [4] had suggested that face form along with other factors played a major role in attrition and influenced facial growth. It is also known that dentofacial characteristics with different underlying variations are related to parafunctional oral habits leading to attrition. No comprehensive work has yet been undertaken to establish the relationship between Myofacial Pain Dysfunction syndrome and face form which may be a contributory factor to the overall symptom complex.

This study was undertaken to evaluate different face forms and certain physical characteristics as predisposing factors in Myofacial pain dysfunction syndrome and thereby demonstrate how knowledge of basic facial types would enhance the clinician's ability to successfully diagnose and treat cranimandibular disorders.

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## Materials and Methods

For the purpose of this study one hundred and three patients suffering from Myofacial Pain Dysfunction syndrome and attending the outpatient department of Dr. R Ahmed Dental College, Kolkata were selected. The patients were between the age range of 18–60 years, belonging to both sexes, having no developmental defects of oral and paraoral structures and possessing normal growth and development of facial structures. Patients having any history of trauma or presence of any systemic disease possibly affecting the masticatory system or the temporomandibular joint were not included in the study. Only such patients were selected who fulfilled one or more of the following criterias which are considered as cardinal manifestations of the disease.

1. Pain and tenderness in the temporomandibular joint and associated areas (Fig. 1).
2. Tenderness of the masticatory muscles.
3. Clicking or popping noise in the temporomandibular joint (Fig. 2).
4. Limitation of jaw movement unilaterally or bilaterally.

The subjects were seated on the dental chair and the nature of the experimental procedure explained to them in details. Their consent were taken prior to clinical examination and for recording different facial measurements.

The following occlusal features were examined intraorally and recorded in the history sheet.

a) Mandibular displacement from Retruded Contact Position (RCP) to Inter-Cuspal Position (ICP). The magnitude of movement of the mandibular incisors from RCP to ICP was assessed visually with the aid of a millimeter ruler in the sagittal plane. An observable anterior shift and/or lateral shift were recorded in the history sheet.
b) Presence of Balancing (Mediotrusive) contacts or interferences.
c) Nature of Occlusion – Group function or Canine guided.
d) The Maxillo-mandibular molar relation according to Angle's classification.

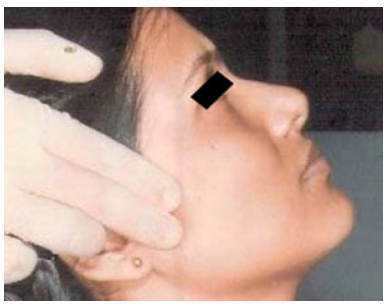

**Fig. 1** Photograph showing lateral palpation of Temporomandibular joint

**Fig. 2** Photograph showing auscultation of Temporomandibular joint area for joint sounds

To assess the severity and degree of dysfunction of the disease M. Helkimo's [5] clinical dysfunction index was used as follows:

| | | Score |
|---|---|---|
| A. | Range of mandibular movement measured at incisors | |
| | 1. Normal range of movement | 0 |
| | (Maximum opening $\geq$ 40 mm; and horizontal movement $\geq$ 7 mm) | |
| | 2. Slightly impaired movement | 1 |
| | (Maximum opening 30–39 mm and horizontal movement 4–6 mm) | |
| | 3. Severely impaired movement | 5 |
| | (Maximum opening $<$ 30 mm and/or horizontal movement 0–3 mm) | |
| B | Temporomandibular joint function | |
| | 1. Smooth movement without TMJ sounds, mandibular deviation on opening or closing $<$ 2 mm | 0 |
| | 2. TMJ sounds in one or both joints or mandibular deviation $\geq$ 2 mm on opening or closing | 1 |
| | 3. Locking or luxation of the TMJ | 5 |
| C | Muscle pain | |
| | 1. No tenderness to palpation in masticatory muscles | 0 |
| | 2. Tenderness to palpation in 1–2 palpation sites of masticatory muscles | 1 |
| | 3. Tenderness to palpation in 3 or more palpation sites of masticatory muscles | 5 |
| D | Temporomandibular joint pain | |
| | 1. No tenderness to palpation | 0 |
| | 2. Tenderness to palpation laterally | 1 |
| | 3. Tenderness to palpation posteriorly | 5 |
| E | Pain on movement of the mandible | |
| | 1. No pain on movement | 0 |
| | 2. Pain on one movement | 1 |
| | 3. Pain on 2 or more movements | 5 |

Total Score: _____Points (Determined as per above examination)

DYSFUNCTION INDEX

| Grades | Score |
|---|---|
| $D_i$ 0 Dysfunction Group No. 0 Clinically symptom free | 0 points |
| $D_i$ I Dysfunction Group No. 1 Mild dysfunction | 1–4 points |
| $D_i$ II Dysfunction Group No. 2 Moderate dysfunction | 5–9 points |
| $D_i$ III Dysfunction Group No.3 Severe dysfunction | 10–25 points |

The clinical examination carried out under this index was as follows:

I. Range of mandibular movement
   (a) Vertical (Fig. 3).
   (b) Horizontal (Fig. 4).
II. Temporomandibular joint function.
III. Muscle Pain (Figs. 5 and 6).
IV. Temporomandibular joint pain.

In order to determine the facial form of the individual clinically M. Kollmann(1892) and H.P. Bimlar's (1958) [3, 10, 11]. Suborbital facial types viz Euryprosopic, Leptoprosopic and Mesoprosopic was used. The following reference points were marked on the face with an indelible pencil.

Nasion: The deepest point in bony profile between the frontal and nasal bones on the midline.

Gnathion: The lowest anterior point along the lower border of the mandible in the midline.

The midpoint of tragus of right and left ears were also marked.

**Fig. 3** Photograph showing measurement of vertical range of mandibular movement

**Fig. 4** Photograph showing measurement of horizontal range of mandibular movement

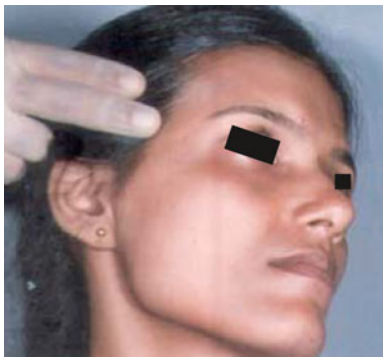

**Fig. 5** Photograph showing palpation of temporalis muscle

**Fig. 6** Photograph showing palpation of masseter muscle

Distance between nasion and gnathion was denoted as 'H' and the distance between tragus of both sides were denoted as 'L'. These distances were measured in mm. by a modified Vernier slide callipers (Fig. 7).

The ratio of the vertical and horizontal component of face for determining face form was calculated by the equation H/L × 100 (Figs. 8 and 9).

**Fig. 7** Photograph showing modified Vernier slide caliper

**Fig. 8** Photograph showing measurement of vertical component of face

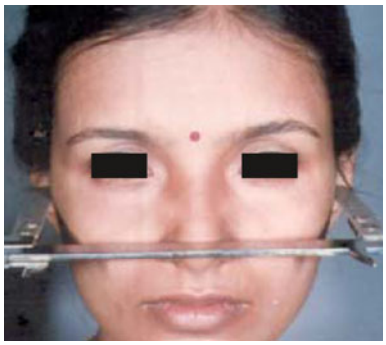

**Fig. 9** Photograph showing measurement of horizontal component of face

When the value of the equation was more than 90 it was called Leptoprosopic, when it was within 84.9 it was called Euryprosopic and when the value varied between 85 and 89.9 the face form was termed Mesoprosopic.

All the factors which were examined were subsequently tabulated and each factor was compared with the degree of dysfunction to establish a correlation between them. The data thus obtained was analysed statistically for results.

## Statistical Analysis

In the present study for statistical analysis of the data the following parameters were used.

1. The mean (X) of each parameter was calculated.
2. The standard deviation (S. D.) was drawn out.
3. The standard error (S.E.) was obtained.
4. Student *t* test was used to analyse the significance of the dysfunction in relation to various parameters.
5. $\chi^2$ test was used to assess the significance of distribution of the subjects in relation to the degree of dysfunction.

## Results

The frequency distribution of subjects in different categories ranging from mild dysfunction ($D_iI$) to severe dysfunction ($D_iIII$) is shown in Table 1. After statistical analysis the distribution and occurrence of cases in relation the three dysfunction indices were found to differ significantly ($\chi^2$ test with 2° of freedom (df) = 31.77 $P < 0.001$, Table 2).

Table 3 shows the mean degree of dysfunction and frequency distribution of subjects with different face forms. To analyse the degree of dysfunction of subjects with different face forms, student *t* test was done of the mean scores in each category of face form. The average score of dysfunction of subjects with Euryprosopic face form (3.963) is slightly higher than Leptoprosopic subjects (2.600). But the score of subjects with Mesoprosopic face from (6.676) is significantly higher than both Euryprosopic and Leptoprosopic face from subjects (t = 3.39, df = 96; $P < 0.05$ and t = 2.31, df = 74, $P < 0.05$). The same manner of scoring was also found in each of the individual dysfunction index groups.

Table 4 shows the degree of dysfunction and the number of cases having the presence or absence of attrition. Statistical analysis shows this distribution of attrition positive cases to be significantly higher than attrition negative cases ($P < 0.001$). It is also seen from the table that the mean score of attrition positive cases is 6.345, which is significantly higher than the mean score of attrition negative cases which is 2.625 (t = 3.923; df = 101; $P < 0.05$).

The comparative evaluation of Angle's classification of malocclusion with the degree of dysfunction is shown in Table 5. $\chi^2$ test in Table 6 shows that the distribution of cases in the three dysfunction indices do not differ significantly between the various types of occlusion ($\chi^2 = 2.519$; df = 4; $P > 0.50$).

Table 7 shows the distribution and degree of dysfunction according to the type of tooth guidance. $\chi^2$ test (Table 8) showed significant results. ($\chi^2 = 24.13$, df = 6, $P < 0.001$) in variations in distribution of cases in the different degrees of dysfunction and the type of occlusion (tooth guidance).

**Table 1** Frequency distribution of subjects according to dysfunction

| $D_i$I | | | | | | $D_i$II | | | | | | $D_i$III | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. of cases | % of total | No. of males | No. of females | Total score | Mean score | SD | No. of cases | % of total | No. of males | No. of females | Total score | Mean score | SD | No. of cases | % of total | No. of males | No. of females | Total score | Mean score | SD |
| 39 | 37.86 | 17 | 22 | 97 | 2.487 | 1.048 | 55 | 53.39 | 19 | 36 | 364 | 6.618 | 1.299 | 9 | 8.73 | 3 | 6 | 133 | 14.778 | 3.383 |

$D_i$ degree of dysfunction, *SD* standard deviation

**Table 2** Contingency table showing distribution of subjects according to dysfunction for determination of $\chi^2$ test

| Frequency | $D_i$I | $D_i$II | $D_i$III | Total |
|---|---|---|---|---|
| Observed (O) | 39 | 55 | 9 | 103 |
| Expected (E) | 34.33 | 34.33 | 34.33 | 103 |
| $(O - E)^2/E$ | 0.6343 | 12.4401 | 18.6926 | |

$\chi^2 = 31.77$, df = 2, $P < 0.001$

$D_i$ degree of dysfunction

The frequency distribution and degree of dysfunction according to the distance from RCP to ICP in the sagittal and horizontal plane is shown in Tables 9 and 10. The mean score of cases having RCP-ICP distances more than 2 mm is significantly greater than the mean score of cases having RCP-ICP distance between 1 and 2 mm and less than 1 mm. In the lateral component of slide the difference of mean score is statistically significant only between the subjects having a slide of more than 1 mm and subjects having a slide from 0.5 to 1 mm.

## Discussion

The purpose of this study was to evaluate the relationship between the degree of dysfunction of the TM joint with different types of face form and with certain occlusal factors. The face form was evaluated directly from measurements made on the patient's face. The highest number of cases (55) accounting for 53.4% of the total are found in dysfunction index II ($D_i$II) & the results were statistically significant ($P < 0.001$). The low number of cases in dysfunction index III ($D_i$III, severe dysfunction) may be due to the need for medical intervention and treatment at the stage of moderate degree of severity thereby preventing further aggravation of symptoms.

The results obtained following comparison of face form with the degree of dysfunction indicate that facial morphology and activity of the masticatory muscles influence the degree of dysfunction of the Temporomandibular joint. The results finds support from the work of J.E.V. Sickles and D.W. Ivey [1] who found that individuals with square shaped faces and well developed masseter muscles had an anatomic variation of overclosure with secondary Myofacial pain dysfunction syndrome A. Weinberger (1955) [4] had stated that attrition occurs due to dysfunctional or non-masticatory habits. He suggested that attrition had a direct relationship with the facial contour and was highest in subjects with square type of face from. R.A. Pertes [6] also stated that there was high activity of masticatory

**Table 3** Degree of dysfunction according to face form

| Sl. no. | Face form | $D_i$I | | | | $D_i$II | | | | $D_i$III | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. |
| 1. | Mesoprosopic | 19 | 51 | 2.684 | 1.057 | 44 | 301 | 6.841 | 1.311 | 8 | 122 | 15.250 | 3.284 | 71 | 474 | 6.676 | 3.894 |
| 2. | Euryprosopic | 16 | 39 | 2.438 | 1.031 | 10 | 57 | 5.700 | 0.823 | 1 | 11 | 11.000 | | 27 | 107 | 3.963 | 2.312 |
| 3. | Leptoprosopic | 4 | 7 | 1.750 | 0.957 | 1 | 6 | 6.000 | – | | | | | 5 | 13 | 2.600 | 2.074 |

$D_i$ degree of dysfunction, *SD* standard deviation

**Table 4** Degree of dysfunction according to presence or absence of attrition

| Sl. no. | Attrition | $D_i$I | | | | $D_i$II | | | | $D_i$III | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. |
| 1. | Presence of attrition | 26 | 71 | 2.731 | 1.002 | 52 | 348 | 6.692 | 1.292 | 9 | 133 | 14.777 | 3.383 | 87 | 552 | 6.345 | 3.716 |
| 2. | Absence of attrition | 13 | 26 | 2.000 | 1.000 | 3 | 16 | 5.333 | 0.577 | | | | | 16 | 42 | 2.625 | 1.628 |

$D_i$ degree of dysfunction, *SD* standard deviation

**Table 5** Degree of dysfunction according to occlusion (Angle's classification)

| Sl. no. | Type of Occlusion (Angle) | $D_iI$ | | | $D_iII$ | | | $D_iIII$ | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. |
| 1. | Class I | 24 | 56 | 2.333 | 1.090 | 40 | 273 | 6.825 | 1.357 | 7 | 109 | 15.571 | 1.509 | 71 | 438 | 6.169 | 3.967 |
| 2. | Class II | 10 | 29 | 2.900 | 0.994 | 11 | 64 | 5.818 | 0.874 | 2 | 24 | 12.000 | 1.414 | 23 | 117 | 5.086 | 2.762 |
| 3. | Class III | 5 | 12 | 2.400 | 0.894 | 4 | 27 | 6.750 | 0.957 | | | | | 9 | 39 | 4.333 | 2.449 |

$D_i$ degree of dysfunction, *SD* standard deviation

**Table 6** Contingency table showing distribution of cases according to occlusion for determination of $\chi^2$ test

| Types of occlusion | | $D_iI$ | $D_iII$ | $D_iIII$ | Total |
|---|---|---|---|---|---|
| Class I | O | 24 | 40 | 7 | 71 |
| | E | 26.883 | 37.913 | 6.204 | |
| Class II | O | 10 | 11 | 2 | 23 |
| | E | 8.709 | 12.282 | 2.010 | |
| Class III | O | 5 | 4 | 0 | 9 |
| | E | 3.408 | 4.806 | 0.786 | |
| Total | | 39 | 55 | 9 | 103 |

$\chi^2 = 2.519$, df $= 4$, $P > 0.50$

*O* observed frequency, *E* expected frequency, $D_i$ degree of dysfunction

muscle during chewing and closing in centric occlusion in deep-bite patients indicating strong muscles of mastication. Machenna and Turker (1983) stated that maximum bite force is only developed at an optimum length: tension ratio of a muscle. The balance between the ratio of height and width which is present in mesoprosopic face form probably results in greater bite force and attrition thereby leading to masticatory muscle spasm and TMJ dysfunction.

The results of the degree of dysfunction of subjects in relation to presence or absence of attrition shows that while attrition positive cases have a mean score of 6.345; attrition negative cases have a mean score of 2.625. Severe dental wear alone and in combination with abnormal overbite was found to have a positive correlation to dysfunction symptom by M.A. Liebermen, E Gazit et al. (1985) [7]. I.E. Eriksson et al. (1987) [8] also found increased dental wear in all age groups having mandibular dysfunction. Thus the results obtained in this study justify the findings of previous workers.

In this study though Class I cases have the highest mean score it may not bear any direct significance as an etiological factor as Class I malocclusion is more prevalent in the general population compared to Class II or Class III.

The type of tooth guidance compared to the degree of dysfunction reveals that subjects having mediotrusive interferences had the highest mean score of 8.619. In this study though the mean score of cases having interferences is high but the number of cases in this group is low. Hence it can be concluded that this form of occlusal disturbance may be of etiological significance only in a small group of patients, and is not very conclusive.

The results of the comparison between degree of dysfunction and distance from RCP to ICP in sagittal and

**Table 7** Degree of dysfunction according to the type of tooth guidance (occlusion)

| Sl. no. | Type of occlusion (tooth guidance) | $D_iI$ | | | | $D_iII$ | | | | $D_iIII$ | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. |
| 1. | CG | 18 | 46 | 2.556 | 1.097 | 10 | 56 | 5.600 | 0.699 | 1 | 13 | 13.000 | – | 29 | 115 | 3.966 | 2.457 |
| 2. | GF | 12 | 31 | 2.583 | 0.900 | 22 | 148 | 6.727 | 1.162 | | | | | 34 | 179 | 5.265 | 2.274 |
| 3. | CF and GF[a] | 6 | 16 | 2.666 | 1.211 | 11 | 75 | 6.818 | 1.328 | 2 | 28 | 14.000 | 4.243 | 19 | 119 | 6.263 | 3.679 |
| 4. | Neither CF nor GF (mediotrusive interference) | 3 | 4 | 1.333 | 0.577 | 12 | 85 | 7.083 | 1.564 | 6 | 92 | 15.333 | 3.669 | 21 | 181 | 8.619 | 5.528 |

*CG* canine guidance, *GF* group function, $D_i$ degree of dysfunction, *SD* standard deviation

[a] Canine Guided occlusion on one side and Group function on the other side

**Table 8** Contingency table showing distribution of cases according to tooth guidance for determination of $\chi^2$ test

| Types of tooth guidance | | $D_iI$ | $D_iII$ | $D_iIII$ | Total |
|---|---|---|---|---|---|
| CG | O | 18 | 10 | 1 | 29 |
| | E | 10.981 | 15.485 | 2.534 | |
| GF | O | 12 | 22 | 0 | 34 |
| | E | 12.874 | 18.155 | 2.971 | |
| CG and GF | O | 6 | 11 | 2 | 19 |
| | E | 7.194 | 10.146 | 1.660 | |
| MI | O | 3 | 12 | 6 | 21 |
| | E | 7.951 | 11.214 | 1.835 | |
| Total | | 39 | 55 | 9 | 103 |

$\chi^2 = 24.13$, df $= 6$, $P < 0.001$

*O* observed frequency, *E* expected frequency, *CG* canine guidance, *GF* group function, *MI* presence of mediotrusive interference, $D_i$ degree of dysfunction

horizontal planes shows that though the mean score of dysfunction of cases having sagittal RCP-ICP distance greater than 2 mm & lateral distance greater than 1 mm have the highest mean score the number of cases are the least in both the groups. Hence on the basis of these findings it cannot be concluded that such factors constitute a common cause of TMJ dysfunction. A.G. Pullinger et al. (1993) [9] also stated on the basis of their findings that though occlusal parameters contributed to the disease process it could not be considered as the unique or dominant factors in defining Temporomandibular disorder population.

## Summary and Conclusion

With the limits of this study and on the basis of the results obtained it can concluded that

1. Face form plays a significant role in the degree of dysfunction and it is highest in subjects with mesoprosopic face from.
2. Patients having presence of attrition had a higher degree of dysfunction.
3. Morphological malocclusion based on Angle's classification did not have a decisive sole in determination of the degree of dysfunction.
4. Functional occlusal discrepancies in the form of mediotrusive interferences and severe RCP-ICP slides produced higher degree of dysfunction but were restricted to a small number of cases. It therefore has limited etiological significance in determining the severity of dysfunction.

**Table 9** Degree of dysfunction according to RCP-ICP (Sagittal) distance

| Sl. no. | RCP-ICP distance (mm) | $D_i$I | | | | $D_i$II | | | | $D_i$III | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. |
| 1. | 0–<1 | 34 | 90 | 2.647 | 1.012 | 33 | 215 | 6.515 | 1.202 | | | | | 67 | 305 | 4.552 | 2.231 |
| 2. | ≥1–<2 | 5 | 7 | 1.400 | 0.548 | 19 | 128 | 6.737 | 1.408 | 3 | 49 | 16.333 | 5.033 | 27 | 185 | 6.815 | 4.411 |
| 3. | ≥2 | | | | | 3 | 21 | 7.000 | 2.000 | 6 | 84 | 14.000 | 2.449 | 9 | 105 | 11.667 | 4.123 |

$D_i$ degree of dysfunction, *SD* standard deviation

**Table 10** Degree of dysfunction according to RCP-ICP (lateral) distance

| Sl. no. | RCP-ICP distance (mm) | $D_i$I | | | | $D_i$II | | | | $D_i$III | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. | No. of cases | Sum of score | Mean score | S.D. |
| 1. | 0–<0.5 | 37 | 94 | 2.541 | 1.043 | 42 | 272 | 6.476 | 1.254 | | | | | 79 | 366 | 4.633 | 2.278 |
| 2. | ≥0.5–<1 | 2 | 3 | 1.500 | 0.707 | 11 | 79 | 7.182 | 1.471 | 4 | 60 | 15.000 | 4.899 | 17 | 142 | 8.353 | 4.873 |
| 3. | ≥1 | | | | | 2 | 13 | 6.500 | 0.707 | 5 | 73 | 14.600 | 2.191 | 7 | 86 | 12.286 | 4.348 |

$D_i$ degree of dysfunction, *SD* standard deviation

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