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Prophylactic and Postoperative Antimicrobial Effectiveness in Mandibular Impacted Third Molar Surgical Extraction

Beentay NN¹, Kumar SG^{1*}, Khuda F², Abdulsalam RA³

Abstract

Postoperative problems like discomfort, swelling, trismus, and infection are frequently linked to the surgical extraction of mandibular impacted third molars. Because of worries about antibiotic resistance and overuse, the function and timing of antibiotic therapy in lowering these consequences are still debatable. In order to reduce postoperative morbidity, this study compared the efficacy of prophylactic and postoperative regimens in conjunction with anti-inflammatory medication. Twenty patients undergoing mandibular third molar extraction participated in a prospective trial. Two groups of patients (n = 10 each) were created: Prophylactic and postoperative antibiotics together with anti-inflammatory medication were given to Group A, while postoperative antibiotics and anti-inflammatory medication were given to Group B. Preoperative and postoperative days 1, 3, and 7 were used to assess pain (VAS), oedema, trismus, and symptoms of infection. One-way ANOVA was used to analyse the data. On the first postoperative day, both groups showed their highest levels of discomfort, oedema, and trismus before gradually improving. Pain, oedema, and trismus indicated highly significant differences between groups ($p < 0.001$), with Group A continuously displaying the lowest values, followed by Group B. Compared to postoperative antibiotics alone, prophylactic and postoperative antibiotic therapy is more successful at lowering surgical complications.

Keywords: Third molar, prophylactic antibiotics, postoperative complications, swelling, trismus.

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Introduction

The extraction of mandibular impacted third molars, commonly known as wisdom teeth, is among the most frequent procedures performed in oral and maxillofacial surgery.¹ Although it is often considered a routine intervention, it is not devoid of postoperative complications. Patients commonly experience discomfort, including pain, facial, swelling, trismus (difficulty opening the mouth), alveolar osteitis (dry socket) and most significantly, infections.^{2,3} These complications can significantly affect postoperative recovery and patient well-being and in some cases, lead to more serious systemic health concerns.

To address these complications many clinicians, prescribe prophylactic antimicrobial agents. Antibiotics are frequently recommended to reduce microbial contamination during and after surgery, with the aim of promoting faster, smoother healing.^{4,5} However, the effectiveness and necessity of routine antibiotic use remain subjects of ongoing debate. The long-term effects of antibiotic prophylaxis on healing and complication rates remain unclear. Considering these uncertainties and the growing importance of antibiotic stewardship, the present study critically examines the necessity, effectiveness and risks of antimicrobial therapy following surgical removal of mandibular impacted third molars. This study evaluates the effectiveness of prophylactic and postoperative regimens in reducing postoperative morbidity. It specifically assesses differences in pain, swelling, trismus and patient-reported outcomes among the two groups. The objective is to determine the most effective and safe approach, thereby supporting evidence-based clinical decision-making and

promoting rational antibiotic use.

Methodology

Twenty patients who were recommended for surgical extraction of mandibular impacted third molars were included in this prospective study. Two equal groups of participants ($n = 10$ each) were formed: Group B received postoperative antibiotics and anti-inflammatory drugs, while Group A received preventative and postoperative antibiotic therapy. Patients with ASA I or II status who were between the ages of 18 and 40 were included. Immunocompromised people, recent antibiotic usage, pregnancy or lactation, uncontrolled systemic disorders, poor dental hygiene, and known medication sensitivities were among the exclusion criteria. Every participant provided written informed permission.

All treatments were carried out under local anaesthesia utilising standard inferior alveolar, lingual, and buccal nerve block techniques with 2% lignocaine and 1:50,000 adrenaline. Operative time was used to record surgical difficulty. Celecoxib 200 mg was given to all groups combined with amoxicillin 500 mg (or clindamycin 300 mg for allergic patients) either preoperatively and postoperatively (Group A) or postoperatively exclusively (Group B). On days 1, 3, and 7, postoperative evaluations were carried out. A visual analogue scale (VAS) was used to measure pain, standardised facial measurements were used to measure oedema, and the greatest inter-incisal distance was used to determine trismus. One-way ANOVA was used to analyse the data for intergroup comparisons, with a significance level of $p < 0.05$.

Results

Pain scores showed statistically significant differences among the two groups at all postoperative time points as shown in Figure 1. A highly significant difference was observed on Day 1 and Day 3 ($p < 0.001$), while a significant difference was noted on Day 7 ($p < 0.01$). Across all time points, a consistent trend was evident: Group A exhibited the lowest pain scores, followed by Group B, ($A < B$). This pattern indicates that prophylactic and postoperative antibiotics, when combined with anti-inflammatory medication, were most effective at minimizing postoperative pain, whereas patients receiving only anti-inflammatory therapy experienced greater discomfort.

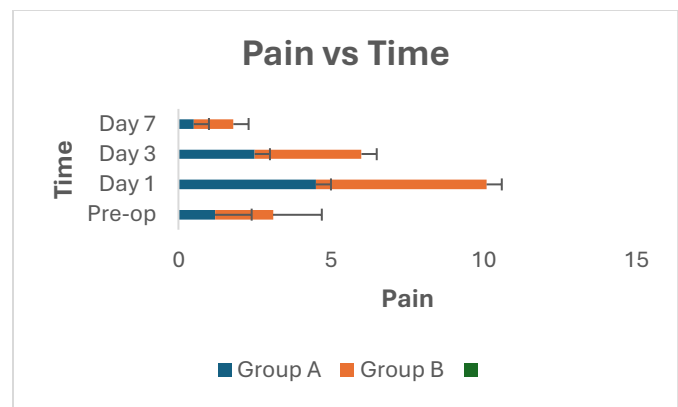


Figure 1: The figure shows pain scoring level at different time point.

Swelling (mm):

Postoperative swelling showed highly significant differences among the two groups at all evaluated time points, including Day 1, Day 3, and Day 7 ($p < 0.001$). A consistent pattern was observed, with Group A demonstrating the least amount of facial swelling throughout the postoperative period, followed by Group B. These findings suggest that the addition of prophylactic and postoperative antibiotics to anti-inflammatory therapy plays a crucial role in minimizing postoperative inflammatory edema compared to the other treatment protocols.

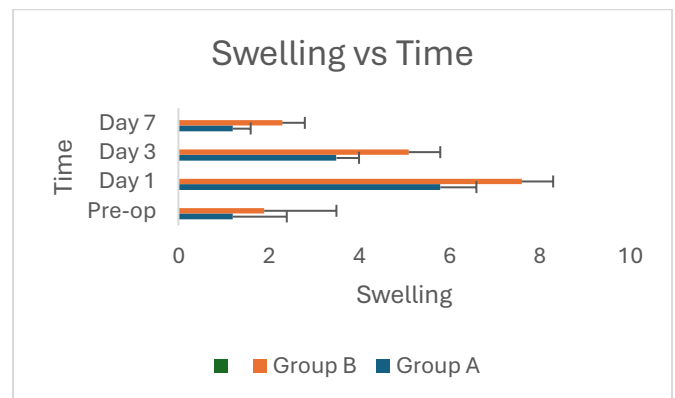


Figure 2: The figure shows pain scoring level at different time point.

Trismus demonstrated a highly significant difference among the two groups at all postoperative time points ($p < 0.001$). Patients in Group A exhibited the least reduction in mouth opening and recovered faster than those in Groups B. A consistent trend was observed: Group A recovered more rapidly, followed by Group B, experienced the greatest trismus and slower improvement over time. These

findings indicate that the combined use of prophylactic and postoperative antibiotics with anti-inflammatory medication contributes to better preservation and quicker restoration of mouth opening following surgery.

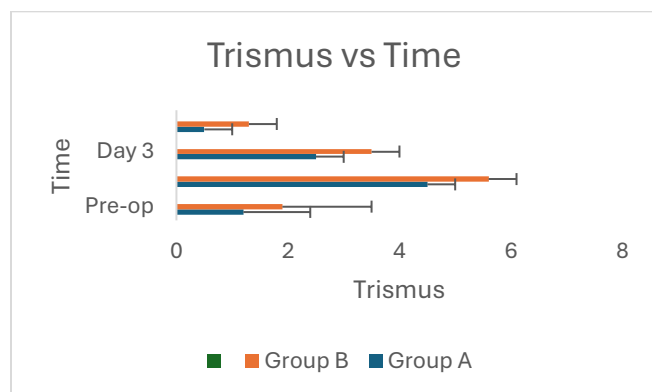


Figure 3: The figure shows pain scoring level at different time point.

Overall pain, swelling and trismus peaked on Day 1 in all groups, then gradually decreased on Day 3 and reached near-complete resolution by Day 7. Group A (prophylactic and postoperative antibiotic regimen) consistently recorded the lowest mean pain scores at all postoperative intervals (Day 1: 4.5 ± 0.5 ; Day 3: 2.5 ± 0.5 ; Day 7: 0.5 ± 0.5), with Group B. Similar trends were observed for swelling and trismus as Group A demonstrated significantly reduced postoperative facial swelling and improved mouth opening compared with the other groups. One-way ANOVA revealed highly significant differences in pain, swelling, and trismus between the groups at Days 1, 3 and 7 ($p < 0.001$). Post hoc comparisons indicated significant improvement between Group A and Group B, a highly significant difference between Group A, and a moderate difference in Group B. This prospective study aimed to comparatively evaluate the effectiveness of prophylactic and postoperative, in combination with anti-inflammatory therapy, in minimizing postoperative morbidity following surgical extraction of mandibular impacted third molars. The findings demonstrated a clear and consistent trend across all postoperative parameters, with the prophylactic plus postoperative antibiotic regimen (Group A) showing superior outcomes, followed by the postoperative-only regimen (Group B).

Discussion

A notable observation in this study was that a proportion of patients presented with preoperative pain, swelling and trismus, indicating the presence of pre-existing inflammatory conditions such as pericoronitis. This is consistent with

clinical reality, as impacted mandibular third molars are frequently associated with varying degrees of local inflammation prior to surgical intervention. The inclusion of such patients enhances the external validity of the study, as it reflects routine clinical scenarios rather than idealized asymptomatic cases. Postoperatively, both groups exhibited a similar temporal pattern, with peak pain, swelling and trismus observed on the first postoperative day, followed by a progressive reduction on days 3 and 7. This pattern aligns with the expected physiological inflammatory response to surgical trauma, where an initial acute phase is followed by gradual resolution and tissue repair. However, despite this common trajectory, the magnitude and rate of recovery differed significantly between the two groups, underscoring the influence of the pharmacological regimens used.

Pain assessment revealed statistically significant differences between Group A and Group B at all postoperative intervals, with highly significant differences on days 1 and 3 ($p < 0.001$) and a significant difference on day 7 ($p < 0.01$). The consistent trend of Group A < Group B indicates that the combined use of prophylactic and postoperative antibiotics with anti-inflammatory therapy was more effective in controlling postoperative pain than postoperative antibiotics with anti-inflammatory therapy alone. The lower pain scores observed in Group A may be attributed to a reduction in bacterial load prior to surgical intervention, which likely attenuated the release of inflammatory mediators that activate nociceptors. In contrast, patients in Group B, who received antibiotics only after surgery, experienced higher pain levels, suggesting that postoperative antibiotics alone may not sufficiently prevent the initial inflammatory cascade triggered during surgical manipulation.

A similar pattern was observed in the evaluation of postoperative swelling. Highly significant differences were observed between the two groups at all time points ($p < 0.001$), with Group A demonstrating less facial swelling than Group B. Swelling is a hallmark of the inflammatory response and is influenced by both surgical trauma and bacterial contamination. The reduced swelling observed in Group A suggests that prophylactic antibiotic administration may help limit the extent of tissue inflammation by controlling microbial proliferation at an early stage. This finding supports the concept that antibiotics, when administered prior to surgery, can indirectly modulate the inflammatory response by reducing the stimulus for cytokine release. Trismus, measured as the reduction in mouth opening, also demonstrated highly significant differences between the two groups ($p < 0.001$). Patients in Group A exhibited less trismus and showed more rapid recovery

compared with Group B. This may be attributed to reduced inflammation and edema in the muscles of mastication, particularly the medial pterygoid muscle, resulting from effective microbial control. Group B showed greater restriction in mouth opening throughout the postoperative period.

The statistical analysis of the data supports these clinical observations. One-way ANOVA revealed highly significant differences in pain, swelling, and trismus between Group A and Group B at all postoperative time points ($p < 0.001$). These findings emphasize that while postoperative antibiotics provide clinical benefit, the addition of a prophylactic component significantly enhances postoperative outcomes. A key implication of this study is the importance of timing in antibiotic administration. Prophylactic antibiotics, when administered prior to surgery, ensure adequate tissue concentrations of the drug at the time of incision, thereby preventing bacterial colonization and reducing the inflammatory response. In contrast, postoperative antibiotics primarily serve a therapeutic role and may not be as effective in preventing the initiation of infection and inflammation. This distinction explains the superior performance of Group A compared with Group B. Despite the clear advantages observed with prophylactic antibiotic use, it is essential to consider the broader context of antibiotic stewardship. The increasing prevalence of antibiotic resistance necessitates a cautious and judicious approach to antibiotic prescribing. While this study's findings support the use of prophylactic antibiotics to reduce postoperative morbidity, their routine use in all patients may not be justified. Instead, antibiotic use should be individualized based on patient-specific factors such as pre-existing infection, systemic health status and surgical complexity.

Conclusion

In conclusion, this study demonstrates that a combined prophylactic and postoperative antibiotic regimen is more effective than postoperative antibiotics alone or anti-inflammatory therapy without antibiotics for minimizing postoperative pain, swelling, trismus and infection. These findings underscore the importance of preoperative antibiotic administration in improving clinical outcomes following mandibular third molar surgery. Nevertheless, antibiotic use should be guided by evidence-based principles and tailored to individual patient needs to optimize outcomes and minimize the risk of antibiotic resistance.

Ethical Approval: The study was conducted in accordance with the ethical approval obtained by ethical committee

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Gender Differences in the Distance Between Incisive Papilla and Maxillary Central Incisors Among Different Face Forms

Nahar KN¹, Shahid H², Ansary JA¹

Abstract

Background: The incisive papilla is a stable anatomical landmark widely used to guide the horizontal placement of the maxillary central incisors during complete denture fabrication, yet limited data exist on how the papilla-to-incisor distance varies by sex within different face forms. This study aimed to determine gender-based differences in the horizontal distance between the incisive papilla and the maxillary central incisors across square, tapering and ovoid face forms among dentate adults.

Methods: This descriptive cross-sectional study included 100 dentate adults aged 20-40 years attending the Department of Prosthodontics, Bangladesh Medical University. Face form was clinically classified, maxillary casts were obtained and the papilla-incisor distance was measured on a cast surveyor using a calibrated protractor and a digital caliper. Data were analyzed in SPSS using mean $\pm$ standard deviation and the independent-samples t-test, with $p < 0.05$ considered significant.

Results: The tapered face form was most common (52.0%), followed by square (39.0%) and ovoid (9.0%). Males showed a consistently greater mean papilla-incisor distance than females across all face forms, with mean differences of 0.24 mm (tapered), 0.52 mm (square) and 0.25 mm (ovoid).

Conclusion: Sex-related differences in the papilla-incisor distance are present within every face-form category and are most pronounced in the square face form, supporting the use of sex- and face-form-specific reference values in prosthodontic tooth positioning.

Keywords: Incisive papilla, face form, maxillary central incisor, sexual dimorphism.

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Introduction

The incisive papilla is a small, pear-shaped elevation of fibrous connective tissue overlying the nasopalatine neurovascular bundle at the anterior end of the palatine raphe and it remains one of the most frequently cited anatomical landmarks for locating the maxillary anterior teeth during complete denture fabrication.¹ Because natural teeth are lost with progressive alveolar bone resorption, the labial contour and horizontal position of the maxillary central incisors can no longer be judged from the residual ridge alone and clinicians must rely on stable intraoral landmarks that persist despite this remodeling. Among the candidate landmarks, the incisive papilla has attracted the widest clinical use because its posterior border shows comparatively little positional change after tooth loss and several investigators have used the horizontal distance between this landmark and the labial surface of the central incisors, commonly termed the papilla-incisor distance, as a practical guide for anterior tooth arrangement.^{1,2}

Reported papilla-incisor distances vary considerably between populations and part of this variability has been attributed to differences in craniofacial and dental arch morphology rather than to measurement error alone. Facial form, traditionally classified according to Williams' typal concept into square, tapering and ovoid categories, has long been proposed to correspond with the outline of the maxillary central incisor and, by extension, with the underlying dental arch.³

Independent of facial form, sexual dimorphism is well established in human dental and craniofacial measurements, with males consistently showing larger arch dimensions, intercanine widths and tooth crown dimensions than females across diverse populations.^{4,5} However, whether this sex-related size difference persists, diminishes, or reverses when the papilla-incisor distance is examined separately within each face-form category has not been adequately explored and most previous papilla-incisor studies have reported pooled or sex-combined values.^{2,6}

This gap is clinically relevant because prosthodontists select and arrange anterior teeth for edentulous patients of both sexes and a landmark-based guide that ignores sex-specific variation within face-form subgroups risks producing dentures with sub-optimal midline and incisor positioning. Data from South Asian populations addressing this specific interaction remain scarce. The present study therefore examined the horizontal distance between the incisive papilla and the maxillary central incisors, stratified simultaneously by sex and face form, in a cohort of dentate Bangladeshi adults.

Objective

To determine gender-based differences in the horizontal distance between the incisive papilla and the maxillary central incisors across square, tapering and ovoid face forms among dentate adults.

Materials and methods

This descriptive cross-sectional study was carried out in the Department of Prosthodontics, Bangladesh Medical University (BMU), Shahbag, Dhaka, over a period of six months. A total of 100 dentate adults attending the outpatient department for treatment of the lower arch were evaluated.

Sample Selection

Inclusion criteria: Participants with an intact maxillary dental arch, periodontally sound maxillary anterior teeth, an Angle's Class I occlusal and arch relationship, of either sex and within 20-40 years of age were included.

Exclusion criteria: Individuals with a supernumerary tooth in the maxillary arch, maxillary midline diastema, any degree of anterior crowding, visible incisal attrition, rotation of the maxillary anterior teeth, a history of orthodontic treatment, a soft-tissue lesion involving the incisive papilla, a history of maxillary surgery, restorations or fractures of the anterior teeth, enamel chipping, or developmental dental anomalies were excluded.

Data Collection Procedure

Participants were selected using a non-probability convenience sampling technique after a structured interview and clinical examination confirmed eligibility. Face form was clinically assessed with the participant seated upright in a

neutral head position, using two imaginary lines drawn approximately 2.5 cm anterior to the tragus and extending to the angle of the mandible; parallel lines defined a square form, lines converging toward the chin defined a tapering form and lines diverging toward the chin defined an ovoid form. A maxillary impression was recorded with high-viscosity alginate using manufacturer-recommended powder-liquid ratios and a standardized mixing technique, then rinsed and disinfected. Casts were poured in dental stone within 15 minutes of impression-making and standardized using a base former. The incisive papilla was identified and its posterior border outlined with a hard lead pencil on the cast, which was then secured to a cast surveyor. A calibrated transparent protractor was positioned with its 90-degree mark superimposed on the surveyor's vertical analyzing pin, itself aligned with the posterior border of the papilla and secured with sticky wax to prevent displacement. The horizontal distance from this reference point to the labial embrasure between the maxillary central incisors was recorded with a digital vernier caliper to the nearest 0.01 mm.

Ethical Consideration

Ethical approval was obtained from the Institutional Review Board of BMU, Shahbag, Dhaka. Written informed consent was secured from all participants after the purpose, procedure and potential physical risks of impression-taking were explained in the local language. Data were coded, anonymized and stored in a locked cabinet accessible only to the research team and no hospital records were used to supplement participant data.

Statistical Analysis

Data were entered and analyzed using SPSS software, with continuous variables summarized as mean $\pm$ standard deviation and categorical variables as frequencies and percentages; between-sex comparisons within each face-form category were performed using the independent-samples t-test and comparisons across face forms were performed using one-way analysis of variance (ANOVA), with a p-value of less than 0.05 taken as the threshold for statistical significance.

Result:

Table 1: Age distribution of study participants

Age group	Frequency (n)	Percentage (%)
20–30 years	70	70
31–40 years	30	30
Total	100	100

As shown in Table 1, the majority of participants (70.0%) were aged 20-30 years, while the remaining 30.0% were aged 31-40 years.

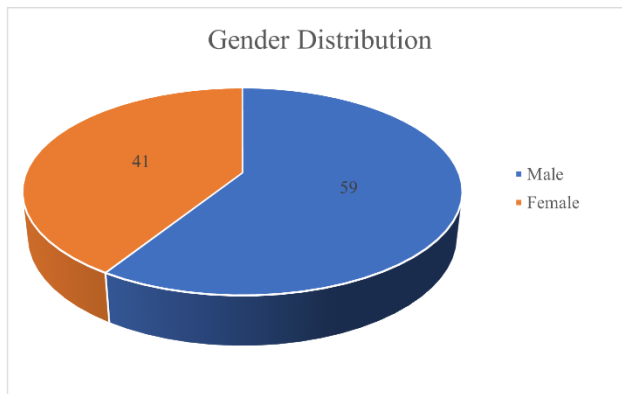


Figure 1: Distribution of the study participants by sex

Figure 1 shows the sex distribution of study participants. Male participants accounted for 59.0% of the study population, while female participants accounted for 41.0%.

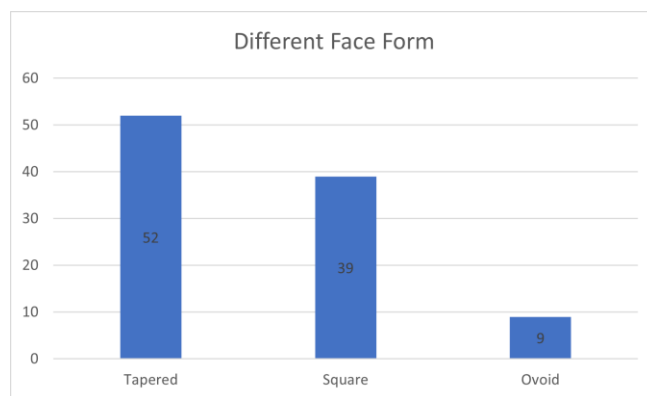


Figure 2. Distribution of participants according to face form

Figure 2 shows the distribution of participants according to face form. Tapered face form was the most common, accounting for 52.0% of participants, followed by square face form (39.0%) and ovoid face form (9.0%).

Table 2: Incisive papilla-to-maxillary central incisor distance according to face form and sex

Face form	Sex	Range (mm)	Mean $\pm$ SD (mm)
Tapered	Male	12.00–13.50	12.59 $\pm$ 0.48
	Female	12.00–13.00	12.35 $\pm$ 0.30
Square	Male	9.50–11.00	10.19 $\pm$ 0.51
	Female	9.00–10.50	9.67 $\pm$ 0.57
Ovoid	Male	10.50–12.50	11.50 $\pm$ 0.79
	Female	10.50–12.00	11.25 $\pm$ 0.65

Among participants with tapered face form, the mean distance was 12.59 ± 0.48 mm in males and 12.35 ± 0.30 mm in females. For square face form, the corresponding means were 10.19 ± 0.51 mm and 9.67 ± 0.57 mm, respectively. Among participants with ovoid face form, the mean distance

was 11.50 ± 0.79 mm in males and 11.25 ± 0.65 mm in females.

Table 3: Comparison of incisive papilla-to-maxillary central incisor distance between males and females within each face form

Face form	Male, mean $\pm$ SD (mm)	Female, mean $\pm$ SD (mm)	Mean difference (mm)	P-value
Tapered	12.59 $\pm$ 0.48	12.35 $\pm$ 0.30	0.24	0.31
Square	10.19 $\pm$ 0.51	9.67 $\pm$ 0.57	0.52	0.007
Ovoid	11.50 $\pm$ 0.79	11.25 $\pm$ 0.65	0.25	0.619

The mean distance was higher in males than females across all three face forms. The mean differences were 0.24 mm for tapered, 0.52 mm for square and 0.25 mm for ovoid face forms. The source thesis did not report sex-specific hypothesis tests; therefore, corresponding P-values are not reported here.

Discussion

In the present study, the mean papilla-to-central-incisor distance ranged from 9.67 mm in females with a square face form to 12.59 mm in males with a tapered face form, a range broadly consistent with values reported in earlier papilla-incisor studies conducted in other populations. Shin and Kim reported a mean papilla-to-incisor distance close to the classical 12 to 13 mm estimate in a Korean sample and although their analysis did not stratify participants by face form, the overall magnitude of their measurements aligns closely with the tapered face-form values recorded in the present cohort.¹ Similarly, findings from Sapkota et al. among dentate Nepalese adults showed comparable papilla-incisor distances and, in agreement with the present results, a tendency toward larger values in male participants, although their study likewise did not examine this difference within face-form subgroups.² Sunila and Maria, working across three South Indian states, reported population-specific variation in papilla-related measurements and highlighted that regional and ethnic differences in palatal and arch morphology can meaningfully shift the papilla-incisor relationship, a consideration that may partly explain why the present values sit toward the lower end of previously published ranges for the square face-form group.⁶ The observation that the square face-form group displayed both the smallest papilla-incisor distance and the largest male-female difference (0.52 mm) merits particular attention. Ashok and Ganapathy demonstrated that face form can be reliably differentiated using objective geometric criteria and reported that women were disproportionately represented among square and ovoid face-form categories, whereas tapering forms were more common in men.³ If square-form arches are structurally narrower and more compactly

proportioned, as suggested by earlier arch-form literature, this could plausibly compound the sex-based skeletal size difference already documented for maxillary dental measurements, producing the amplified male-female gap observed here. This interpretation is consistent with a substantial body of odontometric literature demonstrating that male dental and arch dimensions consistently exceed female dimensions. Pandey and Ma, for instance, found that mesiodistal and labiolingual canine dimensions were significantly larger in males than in females, while Mehta et al. reported a similar male predominance for maxillary first molar dimensions.^{4,5} Shetty et al. and Sireesha et al. independently confirmed that canine and inter-canine width measurements retain significant sexual dimorphism across different Indian populations^{7,8} and Bhargava et al. documented sex-related differences extending even to the mesiodistal width of the maxillary central and lateral incisors themselves.⁹ Findings from Mazumder et al. among four ethnic groups of northeastern India similarly showed that arch perimeter, closely related to the anteroposterior and transverse dimensions measured in the present study, was consistently greater in males.¹⁰ Outside South Asia, Salem et al. reported that both maxillary and mandibular intercanine widths remained reliable indicators of sex in an adult Egyptian sample, reinforcing that the sex-related pattern observed in the present tapered and ovoid groups is not population-specific.¹¹

By contrast, the comparatively smaller sex difference noted in the ovoid group (0.25 mm) parallels findings from Rai et al., who reported that palatal and maxillary arch depth measurements, while generally larger in males, showed narrower absolute sex gaps in curved or rounded arch configurations compared with angular ones.¹² Karim and Baban recently applied machine-learning models to odontometric and arch-dimension data and confirmed that combining several anterior-tooth and arch parameters, rather than relying on a single linear measurement, improves the accuracy of sex estimation, a finding that supports the present study's emphasis on evaluating the papilla-incisor distance jointly with face form rather than in isolation.¹³ Facial-proportion-based prediction models further corroborate a biological link between craniofacial form and anterior tooth position: Jassim et al. showed that intercondylar and intercanine distances varied significantly across square, tapering and ovoid facial forms, Chunhabundit et al. derived tooth-size prediction equations from two-dimensional facial measurements in a Thai population and Alshamri et al. confirmed significant correlations between maxillary anterior tooth dimensions and common facial measurements in an adult sample.^{14,15,16} Taken together, these findings suggest that face form is not merely a cosmetic classification but an effect modifier of the magnitude of sexual dimorphism in the papilla-incisor relationship, a nuance that prosthodontists should consider when using papilla-based norms to position maxillary anterior teeth for edentulous patients of either sex.

Conclusion

This study demonstrates that the horizontal distance between the incisive papilla and the maxillary central incisors varies not only with face form but also with sex within each face-form category, with males consistently exceeding females and the square face-form group showing the widest sex-based difference. These findings indicate that papilla-based guides for anterior tooth positioning in complete denture fabrication should be applied with attention to both facial morphology and the patient's sex rather than as a single universal value. Incorporating sex and face-form-specific reference ranges into prosthodontic practice may improve the accuracy of anterior tooth placement and enhance denture esthetics for edentulous patients of both sexes.

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Association between breast feeding pattern and nursing caries in children attending outpatient department of Dhaka Dental College

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Abstract

This cross-sectional study was conducted to determine the association between breastfeeding patterns and nursing caries in children attending the outpatient department of Dhaka Dental College & Hospital, Mirpur, Dhaka, using a pre-tested questionnaire. The study was carried out among 236 mothers who have brought their children aged between 2-5 years with nursing caries. The mean dfs score of the children was found 20.61 ± 5.62 . Among them majority of the children had a dfs score more than 22 (39.8%). The respondents reported a mean breastfeeding duration of 19.03 ± 7.24 months. Among them majority of the respondents breast fed their child up to 24 months (51.3%) and breast fed their child at will (56.4%). Statistical significance was found between the duration of breast feeding and their child's dfs score ($p=0.024$) and statistical significance was also found with the respondent's way of their child feeding and their child's dfs score ($p=0.000$). So, more preventive and awareness building program should be arranged regarding nursing caries and feeding pattern starting even before the childbirth.

Keywords: Nursing caries, breastfeeding pattern.

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Introduction

Dental caries is the most prevalent chronic illness among children, occurring at a rate five times higher than asthma and seven times more frequently than hay fever.¹ The American Academy of Pediatrics identifies it as the most widespread communicable disease in children, impacting 41% of young individuals in the United States.² "Nursing-bottle syndrome" (NBS), also known as "baby bottle tooth decay" or "nursing caries," affects the primary teeth of young children and can manifest as early as nine months old. This condition is linked to extended, unrestricted bottle or breastfeeding and the use of sweetened pacifiers.³ Nursing caries is a distinct form of rapid decay in infants' primary teeth, characterized by the typical absence of decay in the mandibular incisors, setting it apart from traditional rampant caries.⁴ Numerous studies have explored the prevalence of nursing caries. In England, prevalence rates range from 6.8% to 12%, while in the USA, they vary from 11.0% to 53.1%.⁵ Research in India reported a 19.2% prevalence of nursing caries among preschool children.⁶ The intraoral decay pattern of nursing caries is distinctive and indicative of the condition. The four maxillary incisors are primarily affected, whereas the four mandibular incisors generally remain unaffected. Other primary teeth, such as canines, first molars, and second molars, may be involved depending on the duration of the carious process, but the severity of lesions is typically less than that of the maxillary incisors.⁴ The syndrome is associated with harmful feeding practices rather than child neglect.⁷ The caries syndrome arises from prolonged exposure of primary teeth to fermentable liquids like milk. This condition can lead to severe symptoms, including pain and infection, and may be costly to treat.⁸ Regular intake of fermentable carbohydrates, such as juices, milk, and sodas, without proper oral hygiene, heightens the risk of caries due to extended contact between sugars in food and cariogenic bacteria.⁹ This risk is particularly high when these substances are consumed from a feeding bottle

and remain in contact with teeth for extended periods, such as overnight.¹⁰ Unrestricted, on-demand nighttime breastfeeding after the eruption of a child's first tooth can also increase the risk of caries.

Despite nursing caries being multi-factorial, it may be preventable. Tooth brushing regularly aids in removal of plaque from the accessible areas and therefore prevents formation and development of dental caries.¹¹ However, due to physical and cognitive immaturity of the child at the ages of 2 – 5 years, adequate plaque control can only be achieved by the caregiver. Other preventive factors include proper nursing habits and reduction of cariogenic food intake by the child. Early diagnosis of this devastating disease pattern is more difficult in Bangladesh because Parents usually don't take their child for regular dental check-up and they are not aware of the condition, usually they did not know anything or have any information regarding nursing caries. Inadequate oral health can affect diet and nutrition, potentially leading to growth issues in children. It may also cause speech difficulties, diminished self-esteem, behavioral challenges, learning obstacles and pain-related issues, impacting various aspects of everyday life. Proper knowledge of nursing caries and feeding pattern among mothers and care of newly erupting teeth in very young children may prevent the occurrence of nursing caries. This research paper therefore aims at seeking knowledge about association between breast feeding pattern with nursing caries in young children and prioritize education of mothers regarding feeding pattern to prevent nursing caries in their children.

Material and methods

The present study was undertaken to determine the association between breastfeeding patterns and nursing caries in children. It was a descriptive cross-sectional study conducted among 236 mothers who brought their children, aged between 2-5 years, with nursing caries to the outpatient department of Dhaka Dental College & Hospital, Mirpur, Dhaka. These mothers were randomly selected for the study. The study was conducted over one year, from 1st January 2017 to 31st December 2017. The sample was collected using a purposive sampling technique and a pre-tested semi-structured questionnaire and checklist were prepared at the beginning of the study, considering all objectives and variables. Inclusion Criteria were: (1) Mothers with children Aged between 2-5 years with nursing caries, (2) willingly participant. Exclusion Criteria were: (1) Children Aged below 2 years and above 6 years, (2) Children Who do not have nursing caries, (3) those who are not willing to participate, (4) Mentally retarded children and (5) Severely ill children.

At the beginning of the data collection, permission was obtained from the concerned hospital authority. The purpose of the study was explained in detail to the respondents and data was collected by the researcher through face-to-face interviews with mothers who have a child with nursing caries. Clinical examination of their children was done with the help of clinical examination

form after taking consent of the respondents. The data collected from the respondents were checked, cleaned and edited properly before analysis. The statistical analysis was done by computer using Statistical Software Package for Social Science or SPSS version 23. The findings of the study were presented by frequency, percentage in tables and graphs. Mean and standard deviation for continuous variables and frequency distributions for categorical variables were used to describe the characteristics of the total sample. In this study dfs score was categorized by its cumulative percentage. Chi-square test was used to find out any significant relationship between two qualitative variables.

Results

Table-1 shows the distribution of the respondents by duration of breast feeding of their child with nursing caries. The mean duration of breast feeding by the respondents was 19.03 ± 7.24 months. Among them 51.3% respondents breast fed their child Up to 24 months, 28.8% respondents done breast feeding for less than 12 months, 16.5% had done breast feeding up to 18 months and 3.4% respondents done breast feeding above 24 months.

Table-1 Distribution of respondents by their duration of breast feeding of their child with nursing caries (n=236)

Duration of breast feeding (in months)	Frequency	Percentage (%)	Mean $\pm$ SD
Less than 12 months	68	28.8	19.03 $\pm$ 7.24
Up to 18 months	39	16.5	
Up to 24 months	121	51.3	
Above 24 months	8	3.4	
Total	236	100.0	

Table-2 shows the distribution of the respondents by interest of them to breast feeding of their child. Among them 56.4% respondents breast fed their child at will, 43.6% respondents done breast feeding by understanding child's signal.

Table-2 Distribution of respondents by the interest of respondents to breast feed their child (n=236)

Interest of the respondents to breast feed their child	Frequency	Percentage (%)
By understanding child's signal	103	43.60
At will breast feeding by mother	133	56.40
Total	236	100.0

Table-3 shows the distribution of children with nursing caries by their dfs score. The dfs score was categorized according to cumulative percentage. The mean dfs score of the children was found 20.61 ± 5.62 . Among them 39.8%

children had a dfs score more than 22, 33.1% children had a dfs score of 0-18, 27.1% children had a dfs score 19-21.

Table-3 Distribution of children with nursing caries by their dfs score (n=236)

dfs score	Frequency	Percentage (%)	Mean $\pm$ SD
dfs score 0-18	78	33.1	20.61 $\pm$ 5.62
dfs score 19-21	64	27.1	
dfs score more than 22	94	39.8	
Tota l	236	100	

Table-4 Distribution of respondents by their Duration of breast feeding of their child and their child's dfs score (n=236)

Duration of breast feeding by the respondents	Child's df score					
	dfs 0-18		dfs 19-21		dfs more than 22	
	n	Percentage (%)	n	Percentage (%)	n	Percentage (%)
Less than 12 months	23	33.8	23	33.8	22	32.4
Below 18 months	20	51.3	7	17.9	12	30.8
Below 24 months	35	28.9	32	26.4	54	44.6
Above 24 moths	0	0.0	2	25.0	6	75.0
$\chi^2 = 14.513, p=0.024$						

Above table shows association between the distribution of the respondents by their duration of breast feeding done by them and their child's dfs score and statistical significance was found.

Table-5 Distribution of respondents by their way of breast feeding of their child and their child's dfs score (n=236)

way of breast feeding by the respondents	Child's dfs score					
	dfs 0-18		dfs 19-21		dfs more than 22	
	n	Percentage (%)	n	Percentage (%)	n	Percentage (%)
By understanding child's signal	50	48.5	20	19.4	33	32.0
At will breast feeding	28	21.1	44	33.1	61	45.9
$\chi^2 = 20.056, p = 0.000$						

Above table shows association between the distribution of the respondents by their way of breast feeding of their child

and their child's dfs score and statistical significance was found $p=0.000$.

Discussion

A total of 236 child's mother with nursing caries was taken as respondents for this study and their children were clinically examined. The respondent's children with nursing caries of the present study belonged to 2-5 years group. Almost similar age groups of children were studied by some other studies.^{6,12} According to Gruebbel criteria, dfs index is used in this study to record the caries of the children.¹³ dfs index was used which is a modified index of dmfs where missing teeth are ignored. In dmfs, d stands for decayed, m for missing teeth and fs for filled surface. dfs was used instead of dmfs because sometimes it is difficult to understand whether the deciduous teeth are congenitally missing or the deciduous teeth was extracted due to caries. The criteria for identifying nursing caries involve finding caries on the labial or lingual surfaces of a minimum of two maxillary incisors, while ensuring that the mandibular incisors remain unaffected by caries.^{14,15} The dfs score was categorized according to cumulative percentage. The mean dfs score of the children was found 20.61 ± 5.62 . Among them majority of the children had a dfs score more than 22 (39.8%). In a study conducted in Davangere, India, the mean dfs was found in the nursing caries children which was not as high as the present study.⁶ It may be due to presence of high level of fluoride in the water. In another study the mean dfs score was found 22.3 ± 13.4 which is near to the present study result.¹²

The mean breast-feeding duration by the respondents was 19.03 ± 7.24 months. Among them majority of the respondents breast fed their child Up to 24 months (51.3%) and breast fed their child at will (56.4%). Statistical significance was found between the duration of breast feeding and their child's dfs score ($p=0.024$) and statistical significance was also found with the respondent's way of their child feeding and their child's dfs score ($p=0.000$) which may be due to presence of milk for longer period in the mouth due to at will breast feeding of their child and we know that there are four factors responsible for the caries process and time is one of them. A Systemic review and meta-analysis reported that breastfeeding up to age 12 months (more versus less breastfeeding), had a reduced risk of caries (OR 0.50; 95%CI 0.25, 0.99, I2 86.8%) and according to seven studies, children who were breastfed for over 12 months faced a higher likelihood of developing caries compared to those breastfed for less than 12 months (OR 1.99; 1.35, 2.95, I2 69.3%). Additionally, among children breastfed for more than 12 months, those who were fed at night or more frequently exhibited an even greater risk of caries (five studies, OR 7.14; 3.14, 16.23, I2 77.1%).¹⁶

It looks like that at least some of the future interventions to prevent and reduce the damaging sequel of nursing caries should be directed at education of mothers regarding feeding pattern. The education should be given not when the habit of

putting the baby to sleep with the help of breastfeeding or bottle feeding is already established, but before the baby is born. Obviously, education alone may not be enough for prevention; but, if given properly and at right time, it is desirable that it will provide parental guidance before the occurrence of nursing bottle caries.

Limitations of the study

The main limitation of the study is that the study place was selected purposively. So, this sample may not be representing the entire population of Bangladesh. Data was collected by using face to face interview and researcher had to fully depend on the instant opinion of the respondents. As there was no scope of cross checking and re-examining the opinion of the respondents, there may be some scope of bias in the study.

Conclusion

In conclusion, our study shows that occurrence and severity of nursing caries in children is associated with breast feeding pattern. So, more preventive and awareness building program should be arranged regarding nursing caries and feeding pattern starting even before the birth of the child so that mothers can play the main role in preventing nursing caries in their children

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CASE REPORT

A case report: Pulpectomy case on upper left second deciduous molar with swelling and pus

Asif AA¹; Afif A²; Sathi SJ³; Ria F A⁴; Amin M H⁵; Sultana R⁶

Abstract

It is a case of chronic open pulpitis on upper left second deciduous molar with presence of extra oral swelling. Patient was six years old. So, the preservation of tooth was important to prevent malocclusion. The treatment of choice was pulpectomy which was successfully completed. Follow up was done after seven days where all the sign and symptoms were subsided. The tooth was finally restored with permanent restoration.

Keywords: Pulpectomy, Pediatric endodontic, Pulp therapy

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Introduction

Pulpectomy is commonly indicated for primary teeth with extensive carious destruction accompanied by infection of the root canal system.¹ By eliminating the need for premature extraction, this conservative endodontic procedure can help maintain the primary dentition and preserve arch integrity. Early loss of a primary tooth may reduce available arch space, interfere with the normal eruption path of its permanent successor, increase the risk of premolar impaction, and promote mesial displacement of the adjacent permanent molar.² This case was selected for pulpectomy due to necessity for preservation of the tooth despite presence of swelling and pus. At this age extraction of this tooth may cause malocclusion.

History and clinical examination

A 6 years old boy reported to the department of pediatric dentistry of Pioneer dental college and hospital with complaints of pain on upper left posterior segment for 1 month and swelling for 3 days. On clinical examination patient had a gross caries on upper left second deciduous molar with extra oral swelling on left side.

Treatment plan and objectives

Patient history, clinical and radiographic examination revealed that is a case of chronic periapical abscess and treatment option was Pulpectomy of upper left second deciduous molar.

Treatment plan and progress

All remaining caries was removed, followed by careful removal of caries near the pulp. The pulp chamber roof was opened using a high-speed round bur under water coolant. No bleeding was observed from the chamber or canals. During canal exploration with a DG-16 explorer, pus with a foul odor was detected. The chamber was therefore left open for 24 hours to facilitate intraoral drainage. Antibiotics and analgesics were prescribed, and warm saline rinsing was advised. At the second visit, the swelling had subsided, allowing continuation of treatment.

was remarkably reduced as well as pain subsided. Coronal pulp was removed by sharp spoon excavator and radicular pulp was removed with barbed broach.

Working length determination was done by radiographic method. Working length was 13mm in mesiobuccal canal, 10 mm in distobuccal canal, 12 mm in palatal canal. Biomechanical preparation was done with file upto 30 no. in palatal canal and 25 on both mesiobuccal and distobuccal canal. Copious irrigation was done with normal saline. After full length preparation of canal calcium hydroxide was given as intracanal medicament for 7days. After 7 days pain and swelling was subsided. After removal of calcium

hydroxide from canal irrigation was done with normal saline then canal was dried with paper point, Canal was sealed with zinc oxide eugenol sealer.

Results

After 7 days patient was recalled for follow up. Periapical radiograph was taken. Presence of swelling, pus and other sign, symptoms were also subsided. Tooth was finally restored with glass ionomer cement.



Figure-1: Initial clinical condition with radiograph a) Patient with swelling and pus (Front view), b) Patient with swelling and pus (Lateral view), c) Radiograph showing gross caries with periapical radiolucency d) Clinical condition of tooth with gross.

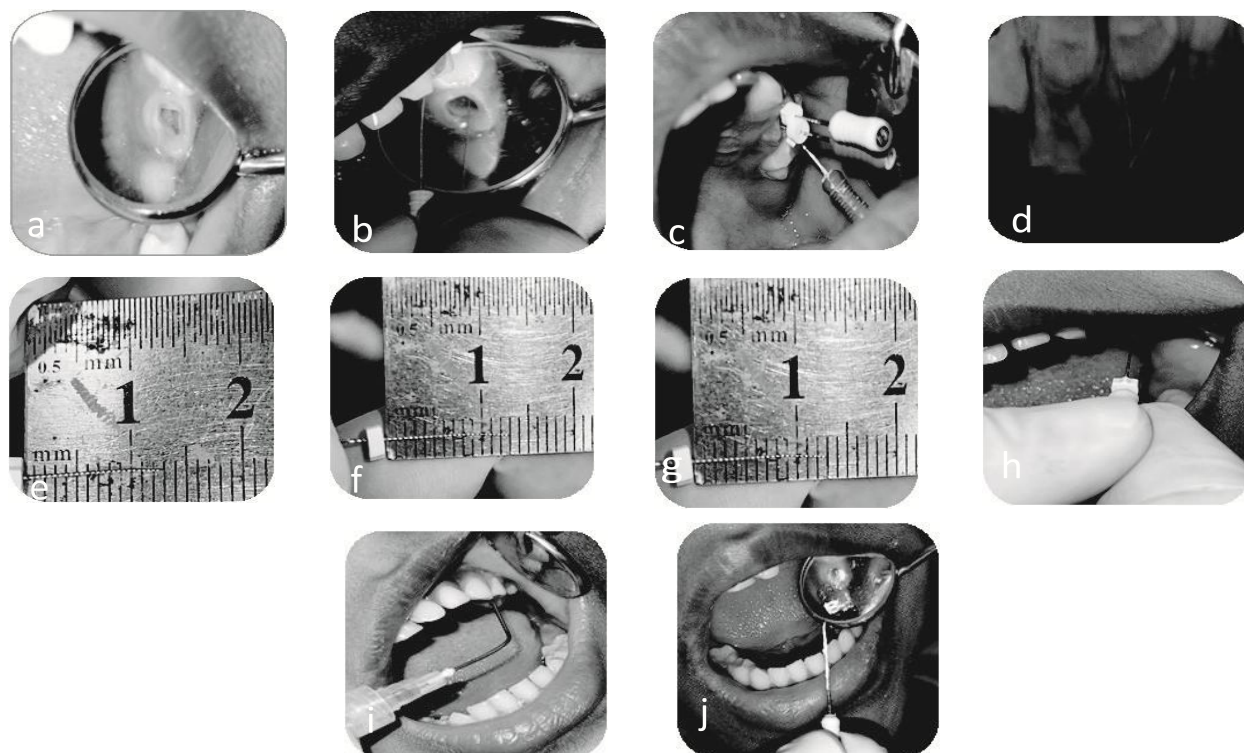


Figure-2: Operative procedures a) Access cavity preparation, b) Canal locating, c) Instruments Used for Working length determination. d) Diagnostic X-ray, e) Mesiobuccal: 13 mm, f) Distobuccal: $10+2=12$ mm g) Palatal: $12+0.5=12.5$ mm, h) Biomechanical preparation of the canal up-to file no 30, i) Irrigation of the canal is done with normal saline, j) After drying the canal, apply calcium hydroxide into the canal.

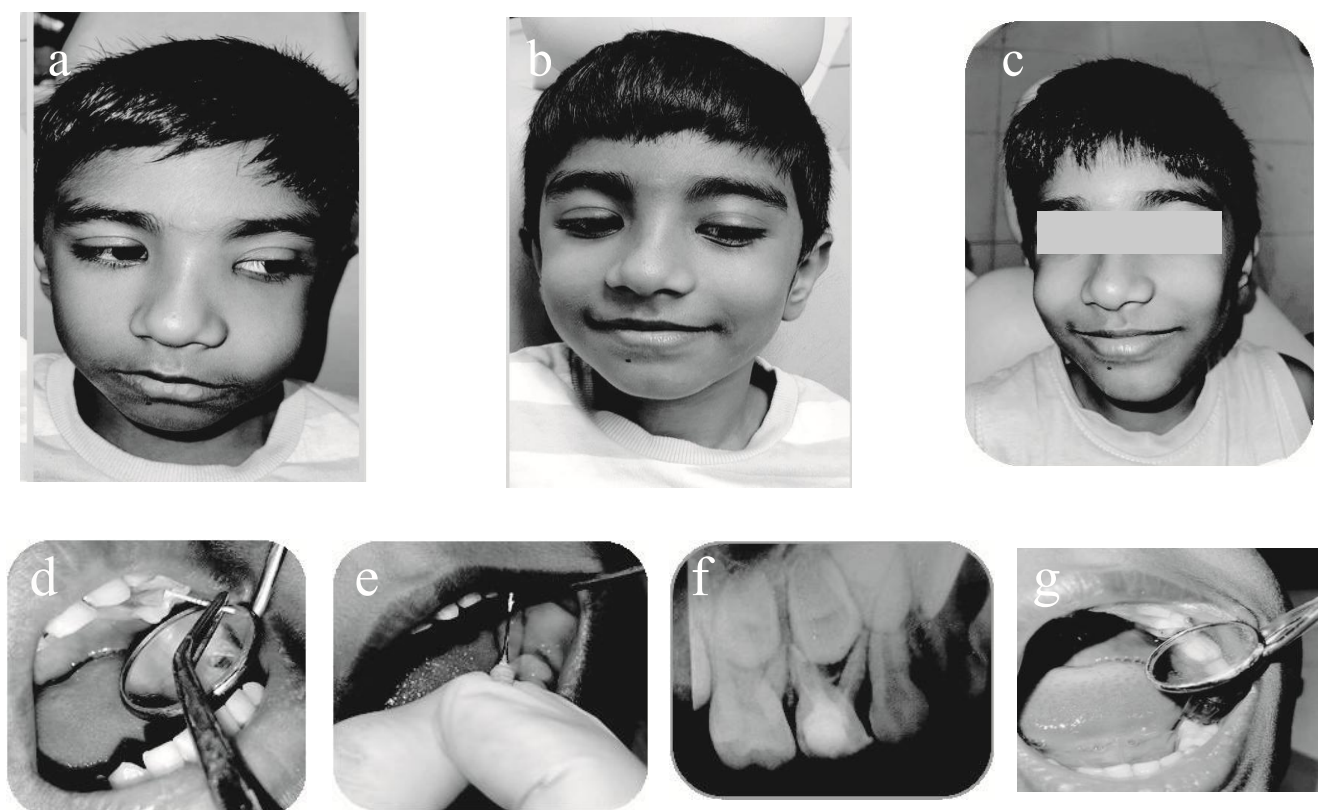


Figure-3: After calcium hydroxide a) Before, b) After, c) After seal 7 days follow, d) Dried the canal with paper point, e) Application of sealer into canal, f) Post Operative Radiograph (After seal) g) Final restoration with Glass ionomer cement

Discussion

The basic idea of the treatment procedure was to preserve the deciduous tooth to maintain its normal physiological function in the oral cavity and prevent malocclusion which may occur if the tooth was its normal shedding time.

Conclusion

We know that premature loss of a primary tooth can result in loss of space for the permanent tooth and that leads to future problems during the eruption phase, so that's why we want to maintain the tooth.

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A case report on perio - restorative approach to correct midline diastema

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Abstract

Midline diastema is a major aesthetic concern for all young patients. Etiology includes abnormal frenum attachment, oral habits and various dental anomalies. Effective treatment requires an accurate diagnosis and a collaborative approach that addresses the various underlying causes. A 19-year-old girl presented with the chief complaint of midline diastema. The high frenum attachment and the residual interseptal tissue present an additional obstacle and its removal was the part of the solution to the aesthetic problem. The treatment plan called for Perio- restorative approach which was used to manage the case and achieve an attractive smile.

Keywords: Midline diastema, high frenum, diastema, dual layering technique, nano filled composite, restorative approach
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Introduction

Midline diastema refers to a gap exceeding 0.5 mm between the proximal surfaces of adjacent teeth at the midline. Various factors contribute to this condition, including an ankylosed central incisor, flared or rotated central incisors, anodontia, macroglossia, dentoalveolar disproportion, localized spacing, closed bite, facial type, ethnic and familial traits, inter-premaxillary suture, and midline pathology. Weber identified causes such as macrognathia, supernumerary teeth, peg-shaped laterals, missing lateral incisors, midline cysts, and habits like thumb sucking, mouth breathing, and tongue thrusting¹. Angle attributed midline diastema to an abnormal frenum². Keene noted that the occurrence of maxillary and mandibular midline diastema is 14.8% and 1.6%, respectively³. A temporary midline diastema often appears during the mixed dentition phase⁴. Effective treatment requires accurate diagnosis and timely intervention tailored to the specific cause. Treatment options include orthodontic removable or simple fixed appliances, frenum excision, restoration techniques using direct composites, laminates, veneers, ceramic restorations, mesiodens extraction, and habit-breaking appliances.

CASE REPORT

A 19-year-old female patient presented with a single diastema between maxillary central incisors (Fig 1a). The Diastema had been a aesthetic concern for an extended period of time. Medical and dental histories were completed and reviewed; care was taken to evaluate the complaint from the view point of the patient. Intraoral examination revealed presence of high frenum attachment and midline spacing between maxillary central incisors of 4mm. Tension test was done to confirm the attachment of the frenum to the marginal gingiva. A periapical radiograph of the intraoral region was performed to check for the existence of mesiodens. The attainment of a proportional aesthetic result required careful treatment planning and pretreatment identification of all potential treatment limitations. A Perio-Aesthetic-Restorative Multiphase Management was planned for the case and a informed consent was taken from the patient.

Perio – Aesthetic Management of Frenum

Mucogingival health plays a crucial role in both the aesthetic appearance of the periodontium and the success of restorative procedures. In this case, a high frenum attachment was the primary cause of midline spacing and hindered oral hygiene maintenance. A frenectomy was conducted using local anesthesia. A hemostat was used to grasp the frenum, reaching the vestibule's depth. An incision was made with a Bard Parker blade no.15 along the hemostat's upper surface, extending past its tip. A similar cut was made along the hemostat's lower surface. The triangular section of the frenum was excised using the hemostat, revealing the fibrous attachment to the bone beneath (Fig 1c). A horizontal incision was made to separate the fibers, and sutures were placed (Fig 1c). The surgical area was cleaned and covered with a periodontal pack, which was removed after two weeks (Fig 1d). Typically, it takes about a month for the mucosa to fully form with the frenum in its new position. Inadequate healing time can prevent complete collagen maturation, gingival shrinkage, and changes in the shape and contour of the interdental papilla. Therefore, periodontal health must be ensured before starting any restorative treatment.

Restorative Management of the Midline Diastema

Patients increasingly seek aesthetic dental procedures that preserve healthy tooth structure and require minimal intervention. Consequently, composite resin has become an important restorative option for anterior aesthetic corrections. Contemporary composites exhibit improved fluorescence, translucency, polishability, and optical properties, allowing restorations to closely reproduce the appearance of natural enamel and dentin. Their conservative nature and satisfactory clinical durability make them particularly useful for aesthetic correction of anterior teeth. Successful outcomes, however, depend on the clinician's understanding of composite characteristics and appropriate material selection according to the clinical situation. Available systems include microfilled, hybrid, microhybrid, and newer nanocomposite formulations. Improvements in the physical and optical performance of these materials have expanded their application in highly aesthetic restorations.

This case demonstrates how appropriate materials, clinical techniques, and contemporary equipment can produce subtle restorative changes while achieving the patient's desired smile. Diastema closure was performed by adding composite resin to the proximal surfaces of the teeth adjacent to the space. Gingival retraction was achieved by positioning a plastic matrix slightly below the gingival margin and adapting it against the lingual tooth surface. Limited preparation was performed with diamond burs to provide surface roughness for improved adhesion and to create bevels at the restoration margins, allowing a gradual transition between the composite and the underlying tooth structure. The enamel preparation also exposed the enamel prism structure, contributing to effective bonding.

Either central incisor may be restored first, depending on the clinician's preference. Among the various technical considerations, reproducing the natural tooth colour is often

the most demanding. A harmonious result depends on selecting an appropriate composite shade, controlling the thickness of each increment, and accurately positioning the material during layering. In the present case, the left central incisor was conditioned with phosphoric acid for 20 seconds, subsequently washed and air-dried. The enamel demonstrated a satisfactory etching pattern. A bonding system was then applied and uniformly dispersed using gentle air pressure. As the preparation remained confined to enamel, no dentin shade was required; an opaque dentin shade and translucent enamel resin were selected.

Composite was placed in small increments and shaped directly by hand to reproduce the desired tooth morphology. Each completed layer was light-cured, with the final restoration receiving 40 seconds of curing. The facial contour was refined using hand instruments before additional light polymerization. Final contouring and surface refinement were performed with composite finishing burs. After restoration, the mesiodistal width was assessed and compared with the corresponding dimensions of the adjacent tooth and the remaining space. Minor discrepancies were corrected using finishing burs or abrasive discs. The neighbouring central incisor was subsequently restored following the same protocol.

Accurate adaptation of the composite at the interface between the two restored teeth was achieved by positioning the matrix firmly against the previously placed composite and stabilizing it with an instrument during light curing (Fig. 1e). Management of the gingival embrasure represents another important consideration in diastema closure because the interdental papilla may appear relatively flat, leaving a visible dark triangular space. Extending the composite contact area apically and slightly toward the lingual aspect increases the restorative volume and can encourage the papilla to occupy a more coronal and facial position within the embrasure, thereby reducing the residual black space.

The optical environment behind the anterior teeth also influences the final appearance of a restoration. Because the oral cavity posterior to the teeth provides a relatively dark background, inadequate control of translucency may make the restoration appear excessively grey or dull. Incorporating an appropriate opaque composite layer on the lingual aspect can mask this background and contribute to a more lifelike appearance. Such an opaque layer may be unnecessary in very small diastemas or when the teeth have substantial buccolingual thickness.⁴

Composite resin represents a practical option for diastema closure because it can be highly polished, provides satisfactory clinical durability, and can reproduce the colour and optical characteristics of natural dental tissues. Compared with indirect restorative procedures, direct composite bonding generally requires less removal of sound tooth structure. Furthermore, freehand application allows precise control over tooth form, contour, contact, and aesthetics, facilitating integration of functional and cosmetic objectives while potentially contributing to the long-term performance of the restoration.⁵⁻⁶

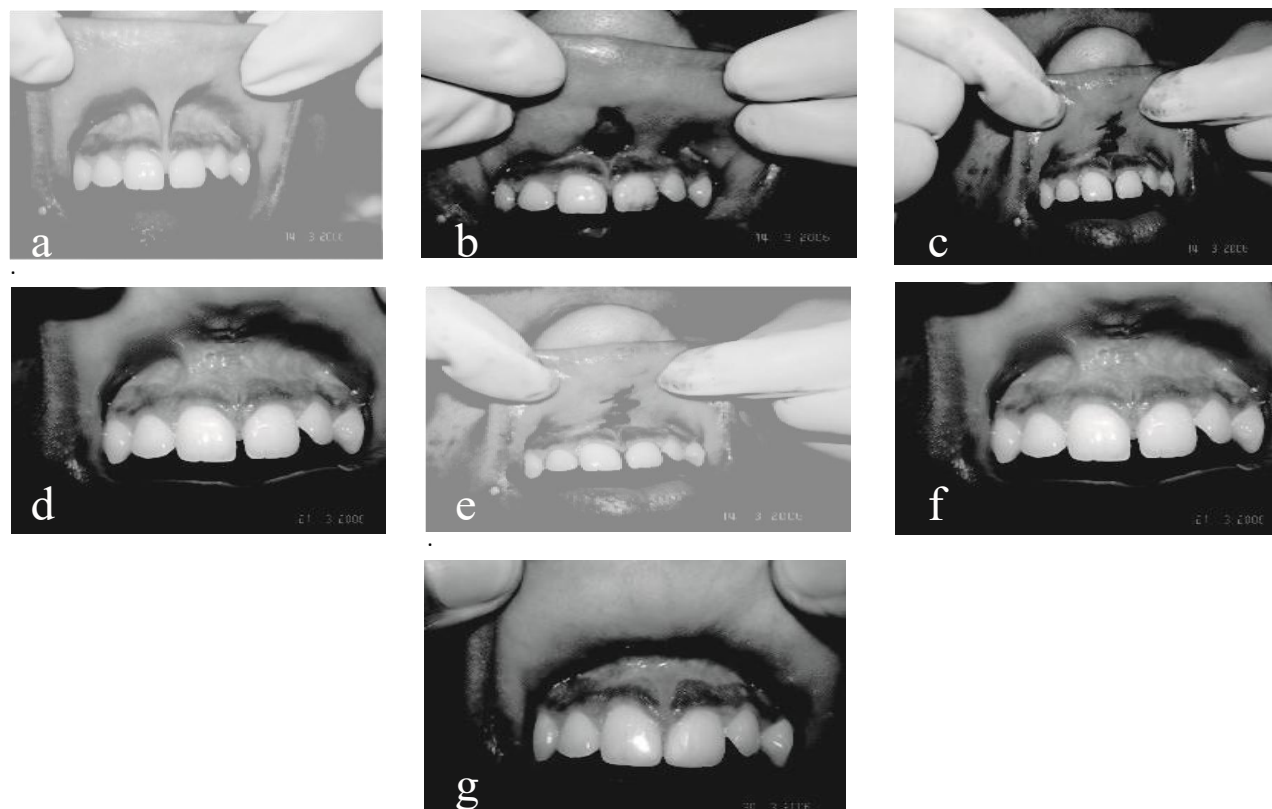


Figure 1: Procedure of frenectomy

Conclusion

Successful diastema closure requires careful assessment of aesthetic expectations, functional needs, and biological considerations. Treatment planning should involve shared decision-making between the clinician and patient to identify the most appropriate and conservative approach for the individual case. Proper case selection and material choice can achieve satisfactory aesthetic results while preserving dental function and biological integrity. In this case, the patient's treatment goal was successfully accomplished through a limited number of minimally invasive procedures, producing an outcome beyond her expectations. Knowledge of contemporary restorative materials and appropriate use of modern technologies can further support predictable, conservative, and aesthetically pleasing dental treatment.

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Early diagnosis: Key to prevent malocclusion

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Abstract

Maloccluded teeth need orthodontic treatment. But in some cases, it seems difficult to justify the need for orthodontic treatment in the dental clinics and hospitals without using the diagnostic tools especially at the remote areas. This ultimately increases the number of orthodontic patients seeking treatment and depriving the genuine patients from receiving treatment in proper time. Proper diagnosis and early intervention of malocclusion in dental clinics and hospitals, with very minimum efforts could be a key to prevent this unwanted situation.

This article therefore was designed to discuss these practical oriented and frequently encountered problems in the dental clinics and hospitals of Bangladesh and to find out a guide line to an easy solution of it.

Keywords: Malocclusion, Psychosocial problem, Oral function, Overbite (OB), Overjet (OJ)

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Introduction

Normal occlusion and malocclusion are two opposite side of a coin. However, there are some cases where it is difficult to differentiate normal occlusion from malocclusion. Normally it is very easy to notice malocclusion in patients but in some cases other features make it difficult to identify as malocclusion. Before we discuss the present article, it would be logical to focus a little on different aspect of normal occlusion and malocclusion for easy understanding of the readers.

What is Normal Occlusion?

It is well known among the dentists that Angle's Class I molar relationship along with class I canine and incisor relationship with 2-3 mm overjet and overbite should be considered as normal or ideal occlusion. But there are some patients who have all class I dental features but some minor irregularities push them into malocclusion group. These types of cases sometimes put the dentists in dilemma to decide whether the patients need treatment or not.

What is Malocclusion?

An unacceptable deviation- esthetically and/or functionally from the ideal occlusion is called Malocclusion. (Fig:1a). However, the term "Unacceptable deviation" sometimes used to make the dentists confused to differentiate the malocclusion from that of normal occlusion as there was no such easy method to diagnose this type of case without the diagnostic tools like model casts, orthopantomogram and lateral cephalogram. But in practice sometimes it becomes very important to justify the case on the spot only by the visual appearance of the patient¹.

Therefore, it was inevitable that an easy method should be available in practice to find out who really needs orthodontic treatment.

Problems those lead the patients to seek for the orthodontic treatment:

1. The effects of malocclusion may extend beyond oral health and appearance. Noticeable dental irregularities can adversely affect an individual's self-confidence and may influence social interactions. Children and adolescents may experience unfavourable perceptions among peers at school, while adults may perceive disadvantages in employment-related situations or interpersonal relationships. Thus, the consequences of malocclusion should not be regarded as merely an aesthetic concern.
2. Marked malocclusion can interfere with several components of normal oral function. Individuals with severe occlusal discrepancies may experience difficulty in mastication and such functional limitations can improve substantially following appropriate orthodontic correction. Certain occlusal abnormalities may also interfere with the articulation of particular speech sounds, in which case orthodontic correction may complement speech therapy. Alterations in occlusion and functional adaptation have also been associated with temporomandibular disorders (TMDs), which may present with pain or discomfort in the temporomandibular joint and its surrounding structures.^{1,2}
3. The pattern of occlusion may influence the susceptibility of teeth to trauma and other dental complications. Prominent maxillary incisors, particularly in Class II malocclusion, may be more vulnerable to traumatic injury, with severe trauma potentially resulting in fracture or pulpal devitalization. In patients with a pronounced overbite, the mandibular incisors may impinge on the palatal tissues, producing repeated trauma and, in difficult situations, contributing to damage or loss of the maxillary incisors. Excessive incisor wear may likewise be observed in patients with marked overbite. In addition, malaligned teeth can make effective plaque control more difficult, thereby potentially increasing the risk of dental caries and periodontal disease. Occlusal discrepancies may also contribute to traumatic occlusal forces.

How to diagnose the treatment need?

The extent of an occlusal abnormality is an important consideration when determining whether orthodontic treatment is indicated. Because visual assessment alone may not adequately distinguish minor irregularities from clinically significant malocclusion, several indices have been developed to quantify deviations from normal occlusion and assist in assessing treatment requirements. Among these, the Index of Orthodontic Treatment Need (IOTN), developed

through work including that of Shaw and colleagues, provides a practical approach for evaluating orthodontic treatment need.

The IOTN categorizes patients into five levels, ranging from minimal or no requirement for orthodontic intervention to cases in which treatment is strongly indicated. It incorporates two principal components. The Dental Health Component (DHC) evaluates occlusal and dental characteristics associated with oral health, whereas the Aesthetic Component (AC) assesses dental appearance by comparison with standardized photographic references. Together, these components provide clinicians with a structured means of estimating the severity of malocclusion and determining the likely requirement for orthodontic treatment.

IOTN: Index of Orthodontic Treatment Need

Grade 5 (Extreme/ Need Treatment) Fig: 1b, 1c

- a) Increased Overjet (OJ) > 9mm.
- b) Reverse OJ > 3.5 mm with masticatory / speech defects
- c) Cleft lip and palate defects and craniofacial anomalies.

Grade 4 (Severe/ Need Treatment) Fig: 1d, 1e

- a) Increased OJ > 6 mm but 9 mm.
- b) Increased and complete OB with gingival or palatal trauma.
- c) Reverse OJ > 3.5 mm with no masticatory / speech defects.
- d) Anterior or lateral open bite > 4 mm.
- e) Anterior or posterior cross bite.

Grade 3 (Moderate / Borderline Need) Fig: 1f, 1g

- a) Increased OJ > 3.5 mm but 6 mm with incompetent lips.
- b) Increased and complete OB on gingiva / palate but no trauma.
- c) Reverse OJ > 1 mm but 3.5 mm.
- d) Anterior or posterior cross bite.
- e) Anterior or lateral open bite > 2 mm but 4 mm.

Grade 2 (Mild / Little Need) Fig: 8 & 9

- a) Increased OJ > 3.5 mm but 6 mm with competent lips.
- b) Increased OB 3.5 mm without gingival contact.
- c) Reverse OJ > 0 mm but 1 mm.
- d) Pre-normal or post-normal occlusal relationships without additional anomalies.

Grade 1: No treatment need [Fig. 1j]

Very minor occlusal irregularities, including contact-point displacement of less than 1 mm.

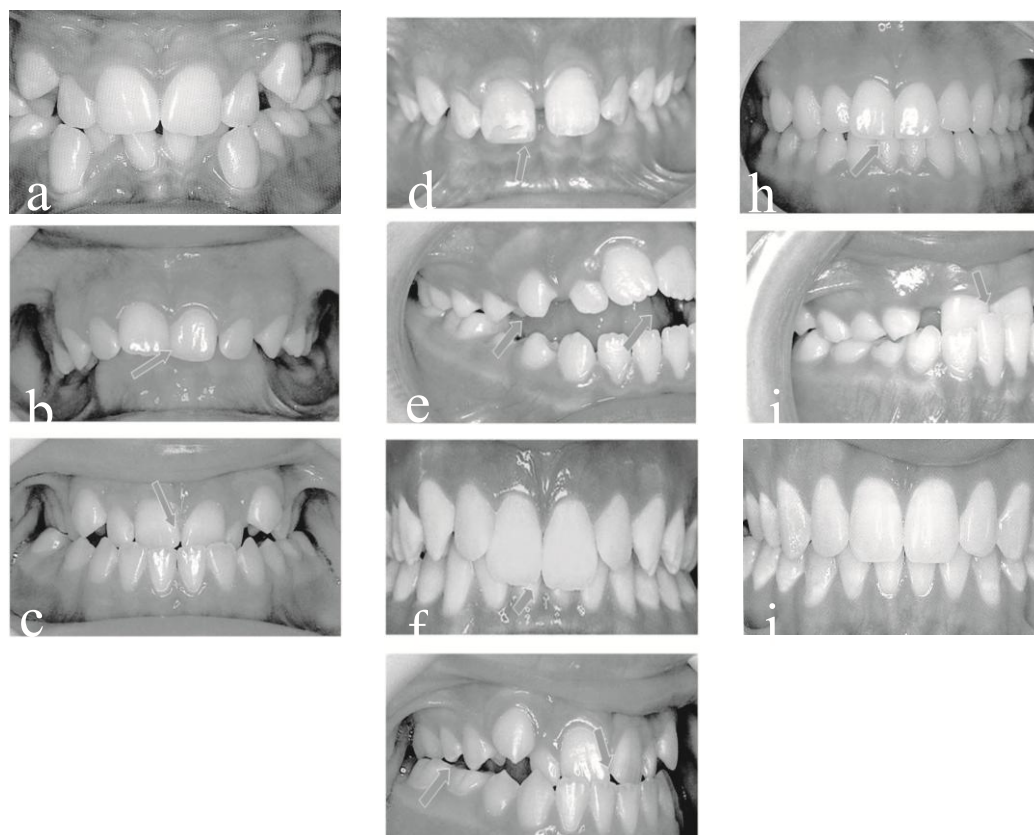


Figure 1: a) Malocclusion, b & c (Grade: 5), d & e (Grade: 4), f & g (Grade: 3), h & i (Grade: 2), j (Grade:1)

Conclusion:

In the present article an effort was made for easy and handy “On the spot diagnosis” of the patients who need orthodontic treatment on the basis of some series of photographs. It might be expected that this widely used method would be proved useful for the dentists in the dental clinics and hospitals in remote areas of our country where the diagnostic tools are not readily available for early diagnosis and proper intervention. Therefore, proper utilization of this easy method would help a great number of orthodontic patients to be diagnosed early to receive the proper treatment thereafter.

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