

## Tooth reattachment: knowledge and practice of Nigerian dentists in postgraduate training

### Mocowanie utraconych fragmentów zęba: wiedza i praktyka wśród nigeryjskich dentystów uczestniczących w szkoleniach podyplomowych

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#### Abstract

**Introduction.** Trauma to teeth is relatively common and reattachment of fractured fragment is one of the available treatment modalities. It is conservative, provides immediate treatment with natural esthetics and faster restoration of function. **Aim of the study.** To assess the knowledge of resident doctors on tooth reattachment and investigate how much of this has been translated into current good clinical practice. **Methodology.** A cross-sectional study that made use of structured self-administered questionnaires completed by resident doctors from different dental specialties in Nigeria. The questionnaire included the demographics of respondents, knowledge about tooth reattachment, sources of information, practice of the procedure amongst others. Data was analysed with SPSS version 20, and p-value was set at  $\leq 0.05$ . **Result.** Participants were aged between 28 and 57 years with mean of  $35.1 \pm 5.7$  years. The majority (95.7%) claimed they had heard about reattachment and 46.7% of these had more than one source of information. About 53% claimed it is indicated in tooth fracture while 4.3% of them stated that tooth avulsion is an indication. Also 53.2% believed that only anterior teeth could benefit from this procedure. Forty-two respondents had observed reattachment procedure before, out of which 18 (42.9%) had actually done it ( $p=0.04$ ). A majority (89%), however, indicated a willingness to have a hands-on training workshop on the procedure. **Conclusion.** Though there is good awareness of reattachment, the practice is very low in this

#### Streszczenie

**Wstęp.** Urazy zębów są stosunkowo powszechne, a ponowne przymocowanie ulamanego fragmentu zęba jest jedną z dostępnych form leczenia. Jest zachowawcza, gwarantuje natychmiastowy efekt z utrzymaniem estetyki i szybkie przywrócenie funkcji zęba. **Cel pracy.** Ocena wiedzy rezydentów co do mocowania utraconych fragmentów zęba i sprawdzenie, ile z tej wiedzy przekłada się na bieżącą praktykę zabiegową. **Metodologia.** Zastosowano badanie przekrojowe za pomocą ankiet wypełnianych przez nigeryjskich rezydentów reprezentujących różne specjalności stomatologiczne. Ankieta obejmowała, między innymi, dane respondentów, wiedzę o technice mocowania fragmentów zęba, źródła informacji i specyfikę samego zabiegu. Dane analizowano za pomocą SPSS wersja 20, a poziom istotności p ustalono na  $\leq 0.05$ . **Wyniki.** Wiek respondentów mieścił się w przedziale 28-57 lat (średnia  $35.1 \pm 5.7$ ). Większość (95.7%) twierdziła, że słyszała o tej technice; z tej liczby 46.7% podawało więcej niż jedno źródło informacji. Około 53% potwierdzało, że procedura jest wskazana przy złamaniach zęba, a 4.3% z tej liczby wymieniało wybicie zęba jako wskazanie. Również 53.2% wyrażało przekonanie, że tylko zęby przednie kwalifikują się do tego zabiegu. Czterdziestu dwóch respondentów miało możliwość uczestniczenia podczas wykonywania tego zabiegu, z czego osiemnastu faktycznie go przeprowadziło ( $p=0.04$ ). Większość (89%) wyrażała gotowość uczestnictwa w praktycznych warsztatach demonstrujących tę technikę. **Wniosek.** Chociaż

#### KEYWORDS:

tooth-reattachment, knowledge, practice, Nigerian dentists

#### HASŁA INDEKSOWE:

mocowanie zęba, wiedza, praktyka, nigeryjscy dentyści

environment. There is, therefore, a need to create even more awareness on the current standard of practice of tooth reattachment among Nigerian dentists.

## Introduction

Dental trauma often results in coronal fractures, the prevalence of which has been reported in this environment to be 38.6% for the simple uncomplicated enamel-dentine fractures while those complicated, involving the enamel, dentine and the pulp accounted for 16.9%.<sup>1</sup> The teeth most commonly affected are the maxillary central incisors, as they occupy a prominently vulnerable position in the dental arch.

Several therapeutic procedures are available for restoring fractured anterior teeth, and the primary goal of the treatment remains aesthetic and functional rehabilitation. Treatment strategies range from simple enamel polishing to prosthetic rehabilitation. The restorative choice is based on various factors such as the extent of the fracture, patient's age, dental eruption and root formation, occlusion, aesthetic expectation, amount and quality of the remaining tooth, pulpal and periodontal involvement, time and economics.<sup>2-4</sup>

In the pre-adhesive era, fractured teeth were restored either with a pin-retained inlay or cast restoration that sacrificed healthy tooth structure; they were a challenge for the clinicians to match colour with the adjacent teeth.<sup>5</sup> A progressive improvement in the field of adhesive dentistry allows clinicians to re-attach a broken tooth fragment to the remaining tooth structure. The concept of tooth re-attachment was first described by Chosaic and Eildeman in 1964 in a 12-year-old child.<sup>6</sup> Tennery later used acid-etch technique for re-attachment of the fractured segment.<sup>7</sup>

Tooth re-attachment is a viable option for managing coronal tooth fractures especially when there is minimal or no violation of the biologic width and the dental fragment is available.<sup>8</sup> It offers a conservative, aesthetic and cost-effective restorative option that has been shown to be an acceptable alternative to the restoration of the

potwierdzono dobrą orientację o zabiegu mocowania fragmentów zęba sama praktyka pozostawia wiele do życzenia. Wynika z tego potrzeba podniesienia świadomości i praktyki tej techniki wśród nigeryjskich dentyistów.

fractured tooth with resin-based composite or full-coverage crown.<sup>9-11</sup> It provides a good and long-lasting aesthetics because the tooth's original anatomic form, colour and surface texture are maintained.<sup>11</sup> Re-attachment procedure can restore function, result in a positive psychological response and is a reasonably simple procedure, less time consuming, and provides a more predictable long-term wear than when direct composite is used.<sup>2</sup> However, the adhesive bond strength of the re-attached fragment is lower when compared with an unbroken tooth, and a 50% fracture rate after 2-3 years has been attributed to a new episode of trauma.<sup>12-13</sup> Patients' co-operation and understanding of the limitations of the treatment is therefore of utmost importance for good prognosis.<sup>3</sup>

Considering the clinical performance and all the advantages as documented by various authors, reattachment should constitute the first line of treatment when the factors are favourable. Consequently, every dentist in post-graduate training is expected to be versatile in this simple and economically advantageous option especially in this environment. It was therefore the aim of this study to assess the knowledge and practice of tooth re-attachment among the selected resident doctors in Nigeria.

## Methodology

This cross-sectional study was conducted at the University College Hospital (UCH), Ibadan, during the update/revision course organized by the West African College of Surgeons. The study participants were the resident doctors who attended the course in April 2016. They were from different dental specialties in Nigeria and completed self-administered structured questionnaires which featured questions on demographics of the respondents, the residents' knowledge about tooth re-attachment, sources of the information, practice

of the procedure, among other data collected. The questionnaires were given to the class representative to distribute willing participants so as to avoid coercion or bias. All the data were collected without personal identification of the respondent.

The data were analysed using SPSS version 20. Descriptive and frequency analysis was performed for the participants' characteristics and Pearson's chi-square was used to test for significance. A p-value of  $\leq 0.05$  was considered statistically significant.

## Results

The age range of the participants (male=57, female=37) in this study was 28-37 years, and the mean age was  $35.1 \pm 5.7$  years. The majority (95.7%) of them claimed to have heard about tooth re-attachment, with a fairly moderate proportion (34%) getting the information through the postgraduate lectures, even though a higher percentage (46.7%) had multiple sources of information (Table 1).

In an open-ended question requesting the respondents to write the indications for tooth re-attachment as a treatment option, though 42.6% claimed ignorance, 37.2% wrote that it could be indicated in tooth fracture generally without specifying the tooth structural component involved. Surprisingly, avulsion as an indication was given by 4.3% (Fig. 1)

With regard to the teeth that can benefit from the treatment option, 53.2% believed the procedure could be done on anterior teeth only, while 31.9% claimed both anterior and posterior teeth could benefit (Fig. 2). Half of the respondents 47 (50%) claimed re-attachment can be done at any age, 15 (16%) said at 11 to 20 years while only 6 (6.4%) mentioned children younger than 10 years (Fig. 3). When asked about the various techniques that can be used to re-attach coronal fractures, 63.8%, 8.5% and 23.4% mentioned direct reattachment, use of post, or both methods respectively. No other specific techniques were written by any of the respondents (Fig. 4).

**Table 1.** Sources of information among the participants

|  |                            |          |
|--|----------------------------|----------|
| Participants' age range                        | 28-37 years                |          |
| Mean Age                                       | $35.1 \pm 5.7$ years       |          |
| Gender   | M=57 (60.6%); F=37 (39.4%) |          |
| <b>Previous knowledge about tooth fragment</b> |                            |          |
| Yes  | 95.7%                      |          |
| No   | 4.3%                       |          |
| <b>Sources of information</b>                  | <b>N</b>                   | <b>%</b> |
| Undergraduate training                         | 15                         | 16       |
| Postgraduate lectures                          | 32                         | 34       |
| Dental journals                                | 2                          | 2.1      |
| Continuing medical education                   | 1                          | 1.1      |
| Multiple source                                | 44                         | 46.7     |
| Total  | 94                         | 99.9     |

Majority had multiple source of information which included postgraduate lectures, journals and CME.

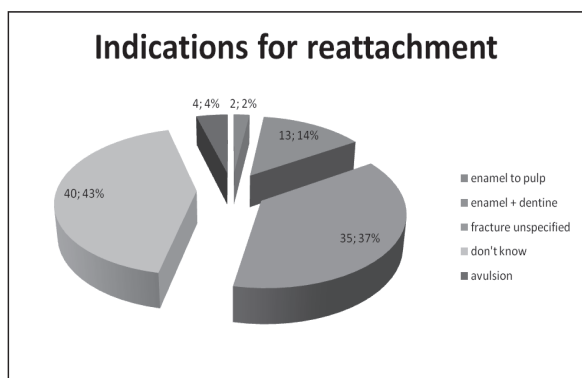


Fig. 1. Indications for tooth fragment reattachment as given by the respondents.

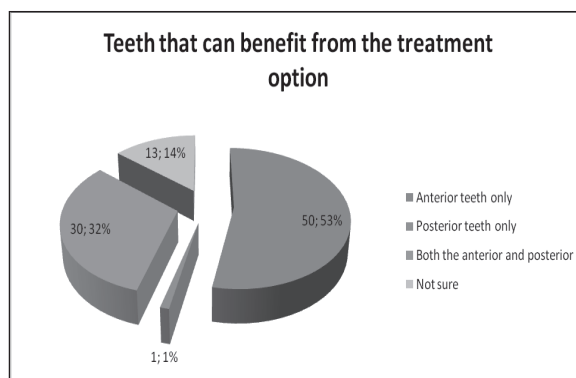


Fig. 2. Participants' response as regards the teeth that can benefit from tooth reattachment.

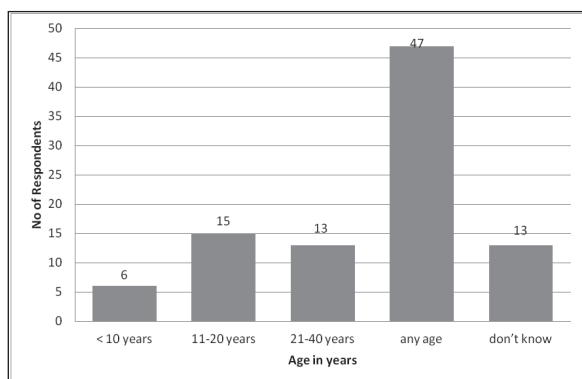


Fig. 3. Age at which reattachment can be done.

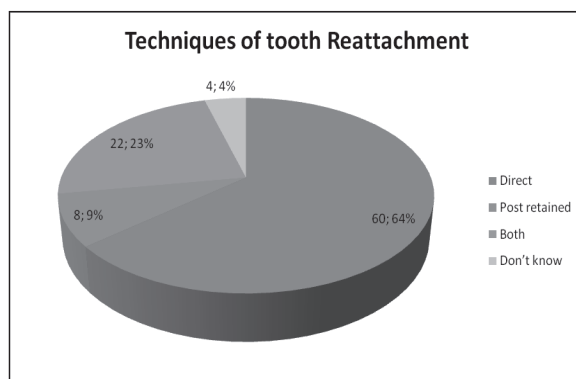


Fig. 4. Techniques of tooth reattachment.

Table 2. Advantages of tooth fragment reattachment

|                                  | Yes (%)   | No (%)    | Don't Know (%) |
|----------------------------------|-----------|-----------|----------------|
| Natural aesthetics               | 84 (89.4) | 2 (2.1)   | 8 (8.5)        |
| Faster restoration of function   | 72 (76.6) | 11 (11.7) | 11 (11.7)      |
| Conservative for tooth structure | 84 (89.4) | 4 (4.3)   | 6 (6.4)        |
| Simple                           | 71 (75.5) | 10 (10.6) | 13 (13.8)      |
| Cost-effective                   | 75 (79.8) | 8 (8.5)   | 11 (11.7)      |
| Prevents malocclusion            | 93 (98.9) | 1 (1.1)   |                |

The main advantage given by the respondents was prevention of malocclusion (98.9%) followed by the restoration of natural aesthetics and conservation of tooth structure for which 89.4% of them responded positively in each case. Only 38 (40.4%) participants listed some disadvantages.

High failure rate was the main demerit as pointed out by 43.2% (Table 2).

Out of the 42 respondents who claimed to have seen cases requiring re-attachment, 18 (42.9%) had actually done it. This was statistically significant  $p=0.00$ . The materials used by the 18 who claimed

**Table 3.** Practice of tooth reattachment among the participants

|   |                 | n  | %    | P-value |
|---|-----------------|----|------|---------|
| Seen cases that needed reattachment before                      | Yes             | 42 | 44.7 | 0.04    |
|   | No              | 52 | 55.3 |         |
| Done reattachment before  | Yes             | 18 | 42.9 |         |
|   | No              | 24 | 57.1 |         |
| Materials used for reattachment                                 | Composite       | 10 | 55.6 |         |
|   | GIC             | 5  | 27.7 |         |
|   | Composite + GIC | 3  | 16.7 |         |
| Would you like to have hands-on training on tooth reattachment? | Yes             | 84 | 89.4 |         |
|   | No              | 7  | 7.4  |         |
|   | I don't know    | 3  | 3.4  |         |

to have performed the procedure were composite resin (55.6%), GIC (27.8%) and combination of GIC and composite resin (16.7%). The majority (89%) indicated the willingness to have hands-on workshop/training on the procedure (Table 3).

## Discussion

Coronal fractures reattachment has been a well-accepted and widely practised procedure since it was first reported in 1964.<sup>6</sup> Several studies<sup>14-23</sup> have documented various aspect of the procedure including the techniques<sup>11,17,19</sup> and materials used.<sup>11-13,21-23</sup> A good knowledge with competence and skill in coronal fracture reattachment should thus be expected from every clinician who will at one time or the other encounter cases with traumatized anterior teeth.

The majority of the participants in our study had heard about the tooth reattachment and it was not unexpected that the source of information was multiple even though postgraduate lectures were a single most commonly reported source of information. Our study showed that this information did not translate into in-depth knowledge as almost half of the respondents would not give the indications for reattachment. The fact that greater than half of the respondents

believed that the procedure is done only on anterior teeth, and only about one percentage mentioned posterior teeth, will be understandable when one considers the fact that most reported cases<sup>2-8,13-18</sup> were done on anterior teeth, though *Terry*<sup>16</sup> stated that reattachment can be performed on anterior or posterior teeth.

With regard to the age at which the procedure could be done, the majority of the participants in our study believed it could be indicated at any age. Though several cases<sup>3,4,6,15,24,25</sup> were reported in children and adolescents, a few<sup>26-29</sup> had been documented among young adults. Reattachment is especially useful in young patients needing apexogenesis or in mixed dentition age where delaying prosthetic restoration of tooth is required until eruption and tooth position is stabilized. It was observed from our study that an in-depth knowledge of various techniques that could be employed to improve retention of attached tooth was lacking among the participating postgraduate doctors. Depending on the patient's presentation, the technique selected may be simple and straightforward, direct/indirect with the use of intraradicular post or involve the preparation of some other retentive features. There are several reattachment reinforcement techniques adapted to

strengthen the tooth structure, like circumferential bevel, external chamfer, V-shape bevel, internal grooves, superficial overcontour of restorative material over the fracture line and pulp chamber in the case of a complicated fracture.<sup>11</sup> However, some authors<sup>30-32</sup> have suggested that additional mechanical tooth preparation in the enamel is not always necessary.

Generally, the knowledge of the merits and demerits of tooth reattachment was high among our participants, nevertheless only a few had carried out the procedure before and the materials they employed were composite resin and glass ionomer cements. The advancements in adhesive

systems and resin composites have been reported to make reattachment of tooth fragments a procedure that is no longer a provisional restoration, but rather a restorative treatment offering a favourable prognosis.<sup>33</sup> As requested, it would be highly advantageous in our environment to organize regular training workshops on this subject in order to update our knowledge and teach clinical skill and competence.

It could be concluded from this study that a good knowledge of tooth reattachment procedure demonstrated by the participant was yet to be translated into adequate clinical practice.

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