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Experience of wrong-site tooth extraction among Nigerian dentists

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Abstract *Objective:* To report the experience of wrong-site tooth extraction among Nigerian dentists.
Study design: A self-administered questionnaire was distributed among a cross-section of Nigerian dentists. Information requested included personal experience on wrong-site tooth/teeth extraction and its after-effect, possible reasons for wrong-site tooth extraction and documentation of the event in patients' case. Respondents were also asked if they were aware of any colleagues who had previously experienced wrong-site tooth extraction and possible legal implication of the event, and if they aware of the universal protocol for preventing wrong site, wrong procedure, and wrong person surgery.
Results: Twenty-two (13%) of the respondents reported having extracted a wrong tooth. The event occurred within 5 years after graduation in most cases. Most respondents (53.6%) informed the patient immediately after the event. Only 68% of the respondents documented the event in patient's case record. Most common reasons for wrong-site tooth extraction were heavy workload, presence of multiple condemned teeth and miscommunication between dentists. Fifty-five percent of

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respondents were aware of a colleague who had extracted a wrong tooth. The most probable legal implication of wrong-site tooth extraction according to the respondents was litigation by the patient. Only 25% of dentists were aware of a universal protocol for preventing wrong-site surgery.

Conclusions: Wrong tooth/teeth extraction is not an uncommon event in the studied environment. The need to be familiar with universal protocol on wrong-site surgery and its legal implications are highlighted.

1. Introduction

Medical errors are a common cause of morbidity and mortality in a variety of health care settings (Brennan et al., 1991; Donchin et al., 1995). The Institute of Medicine (IOM) defined medical error as ''the failure to complete a planned action as intended or the use of a wrong plan to achieve an aim'' (Chang et al., 2004; Kohn et al., 1991; Lee et al., 2007). The importance of medical error has been increasingly recognized, as reflected in a report by the IOM that drew widespread attention (Chang et al., 2004; Kohn et al., 1991).

Wrong-site tooth extraction is a medical error in which a tooth other than the one intended by the referring dentist is extracted (Chang et al., 2004). Little attention has been paid to the serious error of wrong-site tooth extraction in the dental community. This may be partly due to the fact that dentists are reluctant to tell others about their experience with wrong-site extraction (Chang et al., 2004).

There are few reports on wrong-site tooth extraction in the literature despite the fact that its legal implications are well known (Chang et al., 2004; Lee et al., 2007; Laurance, 1991, 1992). In view of the complex therapeutic and medico-legal problems associated with erroneous extraction, this complication deserves more attention (Lee et al., 2007).

The aim of the study was to report the experience of wrong-site tooth extraction (WSTE) among Nigerian dentists with a view to calling the attention of dentists to the universal protocol for preventing wrong site, wrong procedure, and wrong person surgery and possible legal implication of wrong-site surgery.

2. Material and methods

A total of 200 self-administered questionnaires on prevalence of wrong-site tooth extraction (WSTE) were distributed among a cross-section of Nigerian dentists. The information sought included demographics of the respondents, year of graduation and job designation. Other information included personal experience on wrong-site tooth/teeth extraction and its after-effect, possible reasons for wrong-site tooth extraction and documentation of the event in patients' case. Respondents were also asked if they were aware of any colleagues who had previously experienced wrong-site tooth extraction, level of experience of the colleague at the time of the incident, and possible legal implication of the event. They were also asked if they were aware of the universal protocol for preventing wrong site, wrong procedure, and wrong person surgery; and if so, whether they have read the protocol.

Data analysis was done using SPSS for Windows (12.0 version, Chicago IL). Data are presented in descriptive and tabular forms.

3. Results

A total of 171 fully completed questionnaires were returned and included in the analysis. Table 1 shows the characteristics of the respondents. Twenty-two (13%) of the respondents reported having extracted a wrong tooth/teeth. The event occurred within 5 years after graduation as indicated by most respondents (77.2%) (Table 2). Most of the respondents (53.6%) informed the patient immediately after the event. Fifteen (68%) of the respondents claimed they documented the event in patient's case record, while others (32%) did not. Most common reasons for wrong-site tooth extraction were heavy workload, presence of multiple condemned teeth, miscommunication between dentists, miscommunication between dentist and patient, as well as cognitive failure (Table 3). The most frequently wrongly extracted teeth were mandibular molars (Table 4). Age, gender and year of experience of the respondents were not significant factors for wrong-tooth extraction ($P > 0.05$).

Fifty-five percent of respondents were aware of a colleague who had extracted a wrong tooth; and the event occurred in most cases (80%) within 5 years after graduation (Table 5). The most probable legal implication of wrong-site tooth extraction according to the respondents was litigation by the patient (Table 5). However, 8.6% of respondents believed that there is no legal implication. Only 25% ($n = 43$) of dentists were aware of a universal protocol for preventing wrong site, wrong procedure, and wrong person surgery, and about a third of these ($n = 15$) have read the protocol.

Table 1 Characteristics of the respondents.

Age group (years)	Frequency (%)
21–30	74 (43.3)
31–40	81 (47.3)
41–50	14 (8.2)
51–60	2 (1.2)
Gender	
Male	93 (54.4)
Female	78 (45.6)
Years after graduation	
1–5	92 (53.8)
6–10	45 (26.3)
11–20	27 (15.8)
>20	7 (4.1)
Current Job description	
House officers	60 (35.1)
Non-specialist GDP	34 (19.9)
Resident doctors	69 (40.3)
Consultants	8 (4.7)

Table 2 Response to questions about the period the event occurred and what the respondents did thereafter.

Period	Number of respondents (%)
Periods at which the event occurred in respondents' career	
Undergraduate level	1 (4.6)
Housemanship	7 (31.8)
2–5 years post-graduation	10 (45.4)
6–10 years post-graduation	3 (13.6)
>10 years post-graduation	1 (4.6)
Total	22 (100)
Response to the question: what did you do after the event?	
Informed patient	15 (53.6)
Did not inform patient	3 (10.7)
Informed colleague	8 (28.6)
Re-implantation with subsequent RCT	2 (7.1)
Total*	28 (100)

* Some respondents indicated more than one response.

Table 3 Reasons for extraction of a wrong tooth.

Reasons	Frequency
Miscommunication between I and referring dentist	3
Miscommunication between dentist and patient	3
Inexperience	2
Cognitive failure	3
Presence of multiple condemned teeth	5
Presence of grossly decayed teeth	2
Heavy workload	6
Distraction	2
Wrong assessment by the orthodontist	1
Fusion of two teeth	1
Total*	28

* Some respondents indicated more than one response.

Table 4 Site and type of teeth involved in wrong-site tooth extraction.

	Frequency (%)
Site	
Lower teeth	14 (63.6)
Upper teeth	8 (36.4)
Total	22 (100)
Type	
Incisor	1
Canine	1
Premolar	5
Molar	15
Total	22 (100)

Table 5 Period of occurrence of wrong-site tooth extraction in colleagues' career and legal implication of wrong-site tooth extraction.

Period	Number of respondents (%)
Periods at which the event occurred in colleagues' career	
Undergraduate level	8 (8.5)
Housemanship	51 (54.3)
2–5 years post-graduation	24 (25.5)
6–10 years post-graduation	6 (6.4)
>10 years post-graduation	5 (5.3)
Total	94 (100)
Response to possible legal implication of wrong-site tooth extraction	Frequency (%)
Being sued by the patient	152 (72.4)
Practicing licence maybe withdrawn	40 (19.0)
No legal implication	18 (8.6)

4. Discussion

Wrong site, wrong procedure, wrong person surgery (including wrong-site tooth extraction, WSTE) is considered a sentinel event by JCAHO (www.jcaho.org). A sentinel event is defined as an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof (Lee et al., 2007; www.jcaho.org). Such events are termed "sentinel" because they signal the need for immediate investigation and response (Lee et al., 2007; www.jcaho.org).

The actual incidence of WSTE is unknown (Chiodo et al., 1998; Chang et al., 2004; Canale 2005; Lee et al., 2007). However, in view of the commonness of tooth extraction and the fact that medical errors are in general underreported (Brennan et al., 1991; Jerrold and Romeo, 1991), it is reasonable to suggest that the problem of wrong-site tooth extraction may also be underreported.

In the present study, 13% of the respondents reported having extracted a wrong tooth. However, 55% of these respondents were aware of a colleague who had extracted a wrong tooth. This implies that wrong-tooth extraction is not an uncommon event in the studied environment. Chang et al. (2004) reported that the annual incidence rates of wrong-site tooth extraction in a clinical setting in Taiwan from 1996 to 1998 were 0.026%, 0.025%, and 0.046% respectively. Data obtained from Oral and Maxillofacial Surgeons National Insurance Company (OMSNIC), USA showed an average of 48 practitioners per year involved in wrong tooth or site surgery with a limited number of repeat offenders (Lee et al., 2007).

The experience of wrong-site tooth extraction among respondents and their colleagues occurred within 5 years after graduation. While some authors believe experience may play a role in the incidence of wrong-site surgery (Chang et al., 2004), others (Lee et al., 2007) believe otherwise.

Although most of the respondents who had previously extracted a wrong tooth claimed to have informed the patient immediately after the event, about 11% claimed they did not inform the patients, and about a third of them claimed they did not document the event in patient's case note. WSTE needs immediate disclosure, investigation and response (Lee et al., 2007; www.jcaho.org), and it is the obligation of the surgeon to inform the patient immediately after a wrong tooth is extracted (Lee et al., 2007). The ideal protocol is to determine the options for tooth replacement, discuss those options with the referring dentist, and then advise the patient in a solution-oriented manner (Lee et al., 2007). Not revealing the errors is a failure to properly respect a fellow human being (Baumrucker, 2006).

Causes of WSTE include cognitive failure, action lapse, miscommunication, internal communication problems and

problems with communication with the referring doctor/dentist (Chang et al., 2004; Lee et al., 2007). Risk factors for wrong-site tooth extraction include multiple condemned teeth such as third molars, partially erupted teeth mimicking the third molars and grossly decayed teeth (Chang et al., 2004; Lee et al., 2007). The most common reasons for wrong-site tooth extraction according to the respondents were heavy workload, miscommunications, cognitive failure, and multiple condemned teeth. Chang et al. (2004) noted that in majority of WSTE cases in their study, communication broke down between the treatment team members or between the team and the patient.

According to the respondents, mandibular teeth, especially the molars and premolars are the commonly affected wrongly extracted teeth. Although OMSNIC report stated that there seems not be a pattern regarding sites and teeth involved in wrong-site/tooth surgery (Lee et al., 2007). Chang et al. (2004) reported that 87.5% of wrongly extracted teeth in their institutions were posterior teeth.

Although most respondents believe WSTE can attract litigation, few of them (8.6%) believe that no legal issues can arise from the error. Wrong-site surgery is a serious event that can attract litigation from patient and/or their relatives (Brennan et al., 1991; Chang et al., 2004; Lee et al., 2007). OMSNIC reported that 14% of all claims reported to the company were for WSTE. Unlike many of the other claims where a large percentage was defensible, 46% of all wrong-site tooth extraction claims were settled with an indemnity payment (Lee et al., 2007).

Only about a quarter of the respondents claimed they were aware of the universal protocol for preventing wrong site, wrong procedure, and wrong person surgery; and about a third of these have read it. The protocol was formulated for the sole purpose of preventing medical errors and is based on the consensus of experts from the relevant clinical specialists and professional disciplines (Lee et al., 2007; www.jcaho.org). The protocol recommends the following steps for elimination of wrong site, wrong procedure, wrong person surgery: (1) Preoperative verification process. (2) Marking the operative site (on the patient and on the X-ray). (3) ''Time out'' immediately before starting the procedure (www.jcaho.org).

Development of educational programme and informative referral form as well the development of effective communication system among all members of clinical staff and the referring dentists have been shown as an effective means of reducing the incidence of WSTE (Chang et al., 2004; Lee et al., 2007). Chang et al. (2004) carried out a study to investigate the effectiveness of an educational programme on the incidence of wrong-site tooth extraction in an outpatient clinic. The annual incidence rate of erroneous extraction before the programme ranged between 0.025% and 0.046%; and after the educational programme was implemented, a wrong-site tooth extraction did not occur in the department (Chang et al., 2004).

5. Conclusions

Although about 13% of respondents have extracted a wrong tooth before; 55% of them knew of a colleague who had extracted a wrong tooth. This implies that wrong tooth/teeth extraction is not an uncommon event in our environment. To avoid the therapeutic and medico-legal problems associated with wrong-site tooth extraction, there is a need to institute clinical practice guidelines for the prevention of wrong-site tooth extraction in the studied environment. Dentists also need to familiarize themselves with the universal protocol for the prevention of wrong site, wrong procedure, wrong person surgery. In addition, to prevent latent failures leading to wrong-site tooth extraction, verbal communication with the referring dentist is encouraged when the written order for extraction seems ambiguous or misleading.

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