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# **“He was distraught, I was distraught..” Parents’ experiences of accessing emergency care following an avulsion injury to their child**

## **Abstract**

*Objective* To explore how parents access emergency care for their children following avulsion of a permanent tooth

*Method:* Semi-structured qualitative interviews were undertaken with parents of children who had suffered a tooth avulsion injury in the previous two years. The interviews were recorded and transcribed verbatim. Framework analysis was used to analyse the data and interpret the core concepts from the interviews.

*Results:* Nine parents participated in the study. None of the children received the appropriate emergency dental care within the timeframe identified by national and international guidelines. The core themes that emerged following the analysis were knowledge, access and emotion

*Discussion & Conclusions:* The parents who were interviewed for this study had poor knowledge of what to do in the event of a tooth avulsion injury. This lack of knowledge directly impaired their ability to navigate emergency dental care for their child. They described their upset and distress following their child’s injury, but also feelings of frustration and disappointment in relation to the emergency care their child received. There is a need to develop appropriate support and clinical pathways to enable parents to rapidly access appropriate and timely care for their child following a complex dental trauma.

## **Keywords**

## **Introduction**

Avulsion is one of the most severe dento-alveolar injuries. It also carries one of the poorest outcomes for dento-alveolar trauma with 73-96% of replanted teeth being lost prematurely<sup>1</sup>. The damage to the periodontal ligament at the time of the injury, the condition of the tooth’s subsequent storage and the interval prior to replantation all profoundly influence the prognosis for the tooth<sup>2,3,4</sup>. Patients with significant dental trauma, such as avulsion, attend a wide variety of treatment centres due, in part, to the fact that dental injuries occur in a variety of locations and can occur at any time of the day or night. The local dentist, accident and emergency department (usually via Oral and Maxillofacial Surgery (OMFS) team), dental access centre or a secondary dental care provider may provide emergency care for avulsion injuries<sup>5</sup>. Parents, lay people and medical professionals have been shown to have poor knowledge of what to do in the event of an avulsion injury<sup>6,7,8,9</sup>. A UK based multi-centre randomised controlled trial examining different treatment options for avulsion injuries identified that the failure to recruit sufficient patients for the trial stemmed from the lack of teeth replanted within the appropriate timeframe, thus giving the tooth a chance of periodontal healing<sup>10</sup>

Provision of emergency care for avulsion injuries is critical and directly impacts the prognosis of the tooth<sup>1,4</sup>. An avulsed tooth should be replanted and a physiological splint placed as soon as possible after the injury. If the extra-alveolar dry time is greater than 30 minutes or extra alveolar total time is greater than 90 minutes or stored in an appropriate storage medium, then healing following replantation is likely to be by ankylosis.<sup>5</sup> At present there is no defined care pathway for children presenting with significant dental trauma, such as avulsion injuries, despite recommendations in the UK National Clinical Guidelines<sup>5</sup>. If such a pathway is to be developed, it is important to understand how parents access care following significant dental trauma.

Thus, the aim of this study was to explore how parents access emergency care for their children following avulsion of a permanent tooth.

## **Method**

Ethical approval for the project was granted by Dental Research Ethics Committee, University of Leeds, National Research Ethics Service (13/EM/0075) and the Research & Development Department of the Leeds Teaching Hospitals Trust (DT13/10679). Informed consent was obtained from all participants.

### ***Participants and Recruitment***

Parents of children who had suffered avulsion injuries were recruited from Leeds Dental Institute Trauma and Emergency clinics using purposive sampling. To be included in the study the participants' child had suffered an avulsion injury to a permanent tooth in the previous two years.

There were two different methods of approach and recruitment. Firstly staff in the Trauma clinic were made aware of the study through email, and asked to contact the lead author (KK) if they treated a child who presented with an avulsion injury. Parents were not approached on the day of the injury. The parent was given the letter of invitation at a review appointment and KK was present to answer any questions. If the parent agreed to participate, the interview was arranged for a time suitable for the parent.

Secondly, KK reviewed clinical records of children attending the weekly Trauma Clinics at LDI, and children who had sustained an avulsion injury in the past two years were identified. They were either posted the letter of invitation to participate in the study with their child's appointment notice, or given the letter of invitation by reception staff as they waited to be seen on the day of their appointment. KK was present to answer any questions the potential participant may have had, and if they indicated a willingness to take part, informed consent was obtained.

### ***Interviews***

Interviews were semi-structured with the interviewer following a topic guide (supplementary material 1) as a prompt, but allowing for exploration of issues generated by the participant. Topics for discussion were identified through literature review and discussions with the research team.

The opening question 'In your own words could you tell me what happened on the day your child had their accident' aimed to collect some basic information about the cause of the accident, where it occurred and at what time from the parent. Further topics for discussion included: parental action/knowledge of avulsed tooth/teeth, access to emergency care and/or dental care, the timeline of events, treatment provided and accessing follow-up care. Areas of relevance to the research questions were explored as they arose during the interviews and open-ended questions were used to encourage participants to expand on relevant topics.

KK a female postgraduate student in paediatric dentistry, who was not known to the participants in any other capacity than for the research project, conducted the interviews. Interviews took place on the clinic, usually in a side surgery. All interviews were audio-recorded and subsequently transcribed verbatim. A copy of the interview transcript, with a stamped addressed envelope for returns was posted to each participant in the week after the interview. The participant was asked to read the transcript and identify if there were any changes they would like to make. They were given the option of contacting KK by phone or email, or they could post the transcript with any changes required back to the author using the stamped addressed envelope provided. To protect participants' anonymity they were each assigned a code from P1 to P9. Interviews were undertaken until data saturation was reached.

## **Analysis**

Framework analysis was undertaken (supplementary material 2) according to the five-step process recommendations of Ritchie & Spencer<sup>11</sup>. The analysis was conducted by KK and KVC,(an experienced qualitative researcher) in conjunction with the research team (PD, GD). Each line of each transcript was considered, and codes and categories were developed. A coding matrix was generated as initial thoughts developed into more formal ideas (supplementary material 3). KK and KVC undertook this process independently initially. Their respective coding matrices were then compared and combined as appropriate. Disagreements were resolved by consensus. Once all transcripts had been coded they were revised and updated, combining in some instances and creating subcategories in other. Finally they were organised into a hierarchical structure.

A phenomenological approach was adopted for analysing the data, which gives experience primacy<sup>12</sup> and refrains from investigating the underlying assumptions associated with the content of the interview data. A theoretical or deductive approach was used to undertake the analysis<sup>13,14</sup> driven by the research question. Following final analysis results were interpreted using Anderson's Behavioural Model<sup>15</sup>.

Themes were mapped onto the model (Figure 1) in an attempt to offer a more interpretative explanation for participant's access to care which is presented in the discussion.

## **Results**

Eleven parents were approached during the study period and nine took part; a summary of each child's pathway to care is presented in Table 1. Framework analysis elicited three core themes that appeared to illustrate the parents' experiences of accessing emergency and follow-up care following a tooth avulsion injury: knowledge, access and emotion. They are summarised in Figure 2.

### ***Knowledge***

Initial treatment at the site of the accident often relies on the children's parents, friends or their schoolteachers prior to the initial professional contact. In general, the parents in this sample had poor knowledge about what to do if a child avulses a permanent tooth. Grandparents proved to have good knowledge of what to do – placing the tooth in milk and immediately seeking emergency care.

It is interesting to note that there were two parents who did know what to do i.e. that the tooth should be replanted as quickly as possible.

*"I was a first aider and a child minder so I had basic first aid" (P3)*

*"I said 'I need to see somebody' because I knew that, as I used to be a dental nurse myself, I knew that they had to be put back in as soon as possible" (P1)*

This knowledge prompted the mum to go back to A&E (they had previously been turned away and told to find a dentist) and actively seek emergency dental care for her child:

*"We were seen by a doctor, but only because I demanded it" (P1)*

Despite this knowledge, neither parent felt able to attempt to replant the tooth: due to the child's distress, and the significant bleeding that is to be expected after an avulsion injury.

*"No well, when I saw the size of it, it was complete and I just thought no. And his mouth was such a mess anyway" (P3)*

This makes it all the more remarkable that one grandmother, who had no prior knowledge of what to do, instinctively 'put the tooth back in'.

*"She just thought she better push it in as she didn't...she just thought you know she'd push it in" (P4)*

It became clear during the framework analysis process that knowledge and access were intrinsically linked. Parents used their prior knowledge or knowledge they obtained shortly after the accident to proactively access the appropriate care for their child. It is difficult to interpret the levels of knowledge of A&E staff from the parents' accounts only, but parental accounts suggest that there may have been poor levels of knowledge, particularly with regard to the importance of timely treatment. Once the parents understood what had happened and that the tooth needed to be replanted as soon as possible, they used this knowledge to actively seek timely care for their child:

*"About half an hour later my dad rang me. He said you better tell them its priority because you've got the tooth in milk. So I went up to reception, mentioned it to them again and he was basically seen straight away after that" (P6)*

### **Access**

Access to emergency care proved difficult for all participants, and indeed one parent (P4) could not access any emergency care for her child over a weekend period. The period from the initial injury to receiving emergency care is the most critical<sup>1</sup>, but it was during this period that the children in this sample experienced significant delays.

In three cases in this sample, the child was brought to A&E via an ambulance due to other injuries (P3, P7, P9). Other parents brought their child directly to A&E (P1, P5, P8), without attempting to first contact a dentist. At least one A&E department did not feel that they were required to provide emergency treatment for a child with an avulsed tooth

*"They said there's no dentist here, nobody who can deal with it, go back home and find a dentist" (P1)*

Two of the children had their teeth replanted by doctors in A&E (P1, P3) and were then referred to the OMFS team for splinting of the tooth and suturing, if required. In some cases, children were referred to the OMFS team from triage, and this led to some delays:

*"The on-call dental person didn't come for another hour or thereabouts" P8*

A number of parents noted that A&E departments often deal with very serious medical emergencies:

*"I know it's something minor compared to what they're used to" (P1)*

One parent noted that the facilities in A&E were not suitable for providing dental treatment:

*"A&E did the best they could but they didn't have the facilities. We were just in one of those little A&E rooms and she was all by herself" (P6)*

This may point to a lack of awareness of the available emergency dental services, and how to contact them. However, it is also possible that when a severe injury like

this occurs, the parents are not only thinking about their child's teeth and what dental treatment is required, but they are also concerned for their child's overall well-being. There is likely to be significant bleeding from the oral cavity following an avulsion injury and there may be other extra- and intra-oral injuries. So even if out-of-hours emergency dental services were readily available, it may be that some parents would still bring their child to A&E in the first instance.

For all participants the pathway to follow-up care was reported to be much more straightforward. Two were referred directly from A&E to the Children's Department at LDI. One parent attended A&E on return from a holiday abroad where the accident had happened. They were directed to contact their local Salaried Dental Service clinic. Six other participants phoned their dental practice the day after their child's accident, and all were given an emergency appointment and were seen that day. This indicates that GDPs are aware of the severity of these injuries and that the children need to be seen promptly. All parents were pleased with the care their GDP provided

Three GDPs arranged very prompt referral to the LDI, by contacting the department directly in line with the UK National Clinical Guidelines recommendations<sup>5</sup>.

### ***Emotion***

Throughout each of the interviews parents made reference to the wide range of emotions that they felt in the time after their child's accident and whilst they were seeking dental care for them.

*"I panicked, I didn't know what to do" (P5)*

*"When I saw his mouth I started vomiting because it were that bad. I couldn't look at him" (P7)*

This is not surprising for the clinicians who treat children following complex traumatic injuries – they are often acutely aware of the distress and upset such an injury can have not only on the child, but on the parents too.

A number of parents became more distressed while their child was having the avulsed tooth replanted. They noted that their child had not been given any form of pain relief prior to this emergency treatment:

*"He was distraught, I was distraught and this doctor put his tooth back in without anything. That was horrifying" (P1)*

One child's treatment was managed in the A&E department with the use of inhalation sedation ('happy air'). It is interesting to note that their mother was a medical consultant in the same hospital, and the family strongly felt that the only reason their child had his tooth replanted was because of their mother's profession.

Parents were aware that it was an adult tooth that had been knocked out, and, not surprisingly, acknowledged that their child's teeth were important to them:

*"I know it's something minor compared to what they're used to but when it's your child's teeth it's different"(P1)*

A sense of frustration and ultimately disappointment was evident in many of the interviews, particularly in relation to the emergency care their child received:

*"The initial emergency care that was most important, I was really disappointed with" (P1)*

## **Discussion**

This study offers a valuable insight into parents' experiences of accessing care for their children following avulsion of permanent teeth. The core themes identified from parents' accounts of their experiences following tooth avulsion injury can be surmised as barriers to access to emergency dental care and treatment. As such they mirror findings from previous work undertaken in the UK<sup>10</sup> and may explain why so few children managed to receive replantation within a timely fashion. However, the strength of the qualitative approach in this study is to explore this from the patients' perspective. This has, in addition, illuminated potential facilitators to access which have previously not been identified and have the potential to inform future policy intervention. From a behavioural science perspective we can draw upon the Behavioural Model to give us a better understanding of people's use of health services suggesting that it is a function of their "predisposition to using services, factors which enable or impede use and their need for care"<sup>12</sup>. It was not the aim of the study to utilise the Andersen model in analysis but was deemed by the authors to offer further insight to discussion and recommendations resulting from the findings following the framework analysis that was undertaken. The dataset is small and therefore limited our ability to conclude that the model is upheld through our findings. However, despite this limitation, there are burgeoning themes in the data that fit well within the model and thus allow for interpretation in light of this (Figure 1). From the results presented here it is evident that 'knowledge' is a key finding from this study which cuts across all these domains. As a predisposing factor either through parents own expertise or grandparents expertise/experience of the need to access timely emergency dental care it not only affects the health seeking behavior itself but is also an enabler for when access is impeded by professionals (A&E staff) or lack of perceived importance by others (ownership). Emotional responses to the avulsion injury and incident can serve to sometimes derail this by clouding knowledge leading to "distress" resulting in inaction or "panic" which leads to delay in health seeking behavior. The resulting evaluation of health status and satisfaction with the care they received is often "disappointment" and "regret" due to this delay despite most patients receiving follow-up with the appropriate professionals. Thus implications for planners for dental services are in keeping with previous findings for raising public

awareness of emergency dental services; “Combined with poor awareness of the existence of emergency dental services it is not surprising that patients' pathways to care are correspondingly complicated. The planning of emergency dental services should be based on a broader, patient-derived understanding of the need for them”<sup>16</sup>.

If the OMFSteams are to be responsible for the acute management of avulsion injuries in children, it is important that they have sufficient resources to provide the acute care in a timely manner. OMFS have a wide remit of clinical responsibility and it is reasonable to expect that tooth avulsion injuries may not always be the priority when there is limited availability of staff. The fact that the prevalence of avulsion injuries in Yorkshire or the UK is unknown makes it difficult to ensure the service is adequately resourced to deal with these injuries. It is also imperative that the OMFS team is up to date with the recent clinical guidelines for treatment of avulsed permanent teeth<sup>5</sup>. It may be useful to forge links between their teams and the specialist paediatric dentists in the region so there can be smooth transition of care following the initial emergency management of the avulsed tooth.

There are many healthcare professionals in various locations, who can provide emergency care for tooth avulsion injuries – the local dentist, the accident and emergency department, dental access centre or a secondary dental care provider. Perhaps because of this variety, no one group is ultimately responsible for the provision of emergency care, particularly out of hours. This has been identified as an issue in the literature previously<sup>9</sup>. The UK National Clinical Guidelines for Treatment of Avulsed Permanent Teeth<sup>5</sup> include this as one of the five key areas that need improving in the current services:

*“Better provision of emergency dental care with a clinician competent in making the diagnostic decisions and delivering the appropriate treatment”*

Experts in the field of dental trauma research have advised that emergency dental care should be organised so that the service could be provided on a 24-hour basis and that emergency dental staff experienced in acute dental trauma treatment should provide the service<sup>17</sup>. This is currently the model used in some areas of Australia. Although it would be hoped that a service like this would improve the outcomes for children who sustain a complex dental trauma, it is likely to be an expensive service to run. Certainly, in these difficult financial times, a robust cost benefit analysis would be required before local commissioners would consider developing such a system.

## Reflections

The recruitment of participants took place over a three-month period. During this time, three children presented directly to the Paediatric Department at the Leeds Dental Institute, having recently avulsed a permanent tooth. It is possible that the author was not notified of all children who presented with avulsion injuries during this

time. A number of efforts were made to prevent this, including notification to all members of the department that the study was on going.

The other six participants were recruited from those referred to the weekly trauma clinic in LDI. Two further children were identified as fitting the inclusion criteria following review of the patient records but the parents declined to participate. One parent gave no reason for not wanting to take part in the study. The other parent declined because she felt she would become too upset during the course of the interview. Her son was fifteen years old when he avulsed his upper front tooth, and the injury had happened over one year ago. This demonstrates the profound impact an avulsion injury can have on the family, and that the impacts are felt for a significant time period after the initial injury.

Seven of the interview participants were mothers. All had been present at the time of the injury. All of the children who had sustained an avulsion injury were boys. It has been found that boys experience dental injuries at least twice as often as girls<sup>18,19</sup>. A retrospective observational study of the time to initial treatment in avulsion injuries in Scotland found that almost 60% of the sample was boys<sup>20</sup>. This sample is therefore certainly skewed in respect of gender. The average age of the children at the time of the injury was 9 years, 11 months; this is consistent with the literature<sup>21,22</sup>. The sample is thus representative in terms of age at time of injury. Eight of the participants were White British, one was British Asian. In West Yorkshire, where all of the participants were from, just over 10% of the population are Asian or Asian-British<sup>23</sup>. Thus the sample could be considered representative of the local population. Although data saturation was reached in terms of this sample, it is possible that other themes could be elicited from interviews with, for example, parents who did not manage to access specialist care following an avulsion injury.

It must also be noted that all of the participants were recruited from the Children's Department at LDI. They had all therefore, accessed specialist care, as recommended in the UK National Clinical Guidelines Treatment of Avulsed Permanent Teeth in Children<sup>5</sup>. It has been reported that a significant number of children in Yorkshire who have had an avulsion injury have not been referred to specialist care<sup>24</sup>.

## **Conclusions**

The qualitative approach was effective and gave a rich source of information on how parents access emergency and follow-up care for their child following a tooth

avulsion injury. In general, the parents who were interviewed in this study found it difficult to access appropriate emergency care for their child following a tooth avulsion injury. None of the children in the sample received the recommended emergency management within the appropriate time frame.

These parents had a low level of knowledge of what to do in the event of a tooth avulsion injury. Those that knew that the avulsed tooth should be replanted promptly, felt unable to do this, as both they and their child were too distressed. Grandparents emerged as a valuable source of knowledge and in some cases prompted the parents to proactively seek emergency dental care for their child.

The majority of those interviewed found accessing follow-up care easier with several children attending specialist care a couple of days after their accident.

There is a clear need to develop appropriate support and clinical pathways for children who suffer complex dental trauma like avulsion. This should enable parents to rapidly access appropriate information and support them as they navigate emergency dental services, thereby minimising the distress and complications for children suffering avulsion injuries.

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### **Competing Interests**

The authors declare no conflict of interest

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