

Infant Oral Mutilation

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This is an active document; updated August 2011.

Section 1: Introduction

The issue of Infant Oral Mutilation (IOM) has been a concern of Dentaid's since 1996. This followed a fact-finding visit to Northern Uganda by Peter Gardner, the first Chief Executive of Dentaid. On this trip he witnessed first hand the death of a baby girl from septicaemia. The hospital doctor told him that she had had some of her milk teeth removed by using unsterilised bicycle spokes.

It soon became clear that general awareness of IOM is negligible. There exists an increasing body of literature recording the practice but many governments and aid organisations are completely unaware of it.

The aim of this document is to present to the reader our knowledge on Infant Oral Mutilation based on evidence from the literature and anecdotal reports and to consider the factors in planning a strategy 'to start combating the practice of Infant Oral Mutilation'. (Luke Wordley, Chief Executive of Dentaid 2000-2007)

1.1 The Practice of Infant Oral Mutilation

Young children presenting with diarrhoea and fevers are subjected to the extraction of deciduous tooth buds, most commonly canines, as an accepted remedy for their illness. Village traditional healers note swellings in the areas corresponding to unerupted canines that look paler than other parts of the jaw ridge and relate this to the cause of the child's illness. A report on Kenyan Maasai revealed that they justify the belief as 'the bovine calf does not possess canines and is not prone to diarrhoea and febrile illness'.¹

A traditional healer is a person who has no formal medical training but is recognised by the community in which he/she lives as competent to provide health care. People in rural areas strongly believe in the work of the healers – in one study 45 % of people surveyed were advised by esteemed persons in the village to go for traditional treatment; others went without prior advice, and very few sought treatment at a hospital first.²

When tooth buds are extracted they exhibit a milky appearance and the village healer shows the parents so that they can see and feel the "tooth worms" supposedly causing the child's illness. With an infant mortality rate of 133/1000 live births in Tanzania,³ it is understandable that parents are apprehensive about consequences of diseases, and so beliefs such as this become established.

Here this practice has been referred to as 'infant oral mutilation (IOM)'. In other countries it is known by a different name, sometimes specific to a region of a particular country. See Tables 1 and 2 in the appendix.

In Uganda, for years people have translated IOM simply as 'ebinnyo' (with various alternative spellings), but this word actually means the tooth buds. So unless two people know and agree on the jargon falsely passed on for years, if one said "Ebinnyo is good" and the other "Ebinnyo is bad" the former could be saying that the child's tooth buds are good so please don't extract them, or they could actually be saying that the cultural practice of extracting tooth buds is a good thing. The latter could be saying that the tooth buds are bad so extract them or, that the practice of extracting tooth buds is bad. Care is needed in translation.⁵⁶

It is the aim of Dentaaid to increase the awareness of IOM to colleagues in western countries who may never have heard of it, so that efforts can be made to change such practices.

1.2 The History of IOM

The practice of tooth bud extraction has been reported in African countries for many years – including Republic of the Sudan and South Sudan^{4,9}; Tanzania⁵; Kenya¹; Ethiopia⁶; Uganda⁷; Somalia⁸; DR Congo⁴⁷; Burundi⁵⁴; Chad⁴⁹; Rwanda⁵⁵ and Burkina Faso⁶².

The earliest literature report on this practice is found in 1932 in an account of the customs of the pagan tribes of the Nilotic Sudan. The Shilluk tribe were reported to have taken out the lower deciduous incisors in young babies to prevent them becoming ill and dying.¹⁰ The next account is not until 1969 when a group of Danish dentists carried out a dental survey in the Acholi region of Uganda and found that the Acholi tribe removed the lower canine tooth buds in infants as a cure for fevers.¹¹ The clinicians felt it appropriate for the dental profession to be made aware of such 'traditional practices' although its prevalence was reported as being low. It appears that the practice may have indeed originated from Uganda, started by the Lugbara tribe who initiated and spread it amongst other tribes.¹² The practice seemingly moved fast within regions of a country* and across the borders into neighbouring countries. A report in Kenya gives an account of the practice coming from Uganda and Tanzania¹. In 1983 it was seen as being a 'new problem/early rumour'¹³. Now it occurs over a vast region building momentum over recent decades. Evidence from Israel, USA, UK, Australia, Norway, France and New Zealand also shows how the practice can be carried out in migrant populations, far away from its original source.^{14, 15, 8, 16, 17, 18, 19, 46, 49, 64.}

1.3 Teething: myths and facts

The assumption of a connection between common symptoms such as febrile illness and diarrhoea with the eruption of deciduous teeth has been made over many centuries.²⁰ Studies of parents and health professionals show that these beliefs are common.^{21, 22} In 1575 Ambrose Pare, a French army surgeon, began to advocate a new solution to the age old problem of "breeding teeth" – cutting the gums with a lancet. By the 1850's, the belief in lancing the gums was widely and firmly held by the medical profession and the public, and persisted until, with increasing understanding of medicine and diseases, in the 1900's came a gradual change in the belief and practice of the dental profession. In 1910, 1600 deaths in England and Wales were attributed to teething, compared with 5016 in 1839.⁶⁵ But even in 1905 the New York Medical Society published a Home Encyclopaedia of Health which states "the hardening or induration of the gums at the time of teething" to be a common cause of diseases of the stomach and bowels and of convulsions in children and recommends the use of the lancet to incise the inflamed area.²³ However, careful studies carried out in Finland in 1968,²⁴ and in Australia in 1999,²⁵ did not confirm that tooth eruption was associated with fever, rashes or diarrhoea. They both concluded that wrongly ascribing these conditions to teething could lead to delays in the identification and treatment of infections and other serious conditions,

* In an anthropological study in 2000 the author, J Gollings, documents how wars in Uganda in 1971 and 1979 allowed the belief to be passed on to new regions. Interestingly some people even believe that 'false teeth' can be blamed on the war and political unrest, highlighting strong cultural views.²⁶

sometimes with tragic consequences. Current medical observations indicate little more than restlessness, drooling, finger sucking and appetite loss resulting from teething.^{24, 61} The timing of eruption of the deciduous incisors (6-12 months) coincides with the diminution of the circulating maternal humoral immunity conferred via the placenta, and the establishment of the child's own humoral immunity. Most children of this age are susceptible to a myriad of relatively minor infections.⁶¹

Section 2: Review of Literature

Literature on IOM is limited, but there is much to be learnt from previous reports that will influence how an appropriate strategy can be planned and implemented, as well as highlighting the true problem of IOM and the need for this project to be carried out.

One of the aims of this document is to present to the reader a sound understanding of the subject matter being researched, as it is hoped that it will raise awareness of IOM to the profession. This is not an issue that simply occurs in Africa – with refugees coming to the United Kingdom coming from African countries, such as Somalia, dentists may see these patients in their practices.

2.1.1 Geographical Distribution

Most studies have been conducted from East African countries. Maasai reports show that in Kenya the practice of 'plastic tooth' removal came from Tanzania and Uganda in the 1960's.¹ In Sudan this belief was virtually unknown before 1965. However, after the civil war in 1972, refugees began returning to their homelands from neighbouring African countries, bringing with them traditional beliefs acquired from such places.¹² It has also been suggested that the custom of extracting the unerupted canine tooth is named after the Ugandan Lugbara tribe which practised the habit.^{12,}

Within a country there is regional variation with regards to the prevalence of the practice of deciduous tooth removal. Generally it is more common in the rural areas where traditional healers are more sought after for medicinal purposes, as hospitals are mostly in the cities. Most of the research done on this practice involves a prevalence study, and the results are alarming:

Uganda: First reports showed a prevalence of 16.1% of a population of 322 examined with signs of canine enucleation.¹¹ In Northern Uganda an average of over 100 admissions a year with complications following *ebiino* extractions were documented in one paediatric unit (21% resulting in fatality).⁷

Focus group discussions with mothers and grandparents of children under two years who had been taken for "ebiino" extractions revealed that they all knew about the existence of "ebiino" disease apart from two grandmothers who responded that the disease did not exist.⁵⁰ When asked about the causes of the "disease" a common response was that the child contracts the disease in the womb. Other perceived causes were:

- ❖ When a pregnant mother eats diseased maize
- ❖ The disease is not passed from child to child
- ❖ It is caused by a decaying tooth and the "maggot" develops inside the tooth
- ❖ It is caused by an allergy
- ❖ "Ebiino" is caused if a pregnant mother "comes across" an extracted false tooth
- ❖ Some extractors cause the disease by bewitching pregnant mothers.
- ❖ Pregnant women ate meat from infected cows brought down by the Nilotic people. Their children were born with "ebino" and this was transmitted to the next generation.⁵²

Many believed that "ebiino" could not be treated by western medicine.

A 2005 study⁵² in the Mbale region reports that the local traditional healers consider themselves specialists in preventing "Ebiino" in infants. The preventive measures they use are:

- ❖ An obnoxious smelling root of a plant is applied on the gums of a newborn baby and on the mother's breasts for one week.

- ❖ A pregnant mother wears a small package of herbs around her neck till her baby is born
- ❖ A new born baby wears a string of white beads with a pair of white shells round its wrist till aged 2 years
- ❖ The extracted “Ebiino” should not be brought back home but should be thrown away at a cross roads to prevent recurrence of “Ebiino” in the affected child and occurrence in other children in the house. However one mother interviewed gave a history of “Ebiino” in 10 out of her 11 children even though she had thrown away all the extracted “Ebiino” at the cross roads following each extraction.

Kenya: A report on the dentition of Maasai children, studied in 1988, showed 35% of 5-7 year olds had undergone removal of deciduous canine tooth buds.²⁷ In 1995 a further study reported the percentage of children aged between 3-7 years who had removal of the canine tooth buds to be 72%. This shows that the belief of deciduous canines causing febrile illness in children is spreading.¹ In 2010, a study of Maasai children under 2 years showed the practice to be carried out by Traditional Birth Attendants (TBAs) despite having received education and awareness training in primary health care by the Ministry of Health in Kenya.⁶³

Sudan: In a report on 80 infants in a children’s hospital, 70% of infants admitted with diarrhoea had had their deciduous canine teeth extracted as the remedy for their illness.⁴ A later study at a different paediatric department revealed that out of 90 children admitted, all were found to have had at least one or more deciduous canines extracted before presentation.¹¹ A further study conducted on 398 children aged 4-8 years showed 22.4% had been subjected to ‘haifat’ (lancing of the alveolus over the deciduous tooth).²⁸

A report⁴⁸ from the Moru area in 2009 stated that, following discussions with elders in the community, the condition is known as “Achara teeth”. In the 1970s it started in Juba and near the border with Uganda. In the 1980’s it was very common among the Moru community. Achara was said to be a disease often found in children and the “achara” had to be removed. Many gave testimony to having their children’s teeth removed. In the 90’s it became less common as people reverted to “Moru Ways” of doing things. The elders started teaching that this is not “the Moru Way” and the children suffer too much. Today it is rarely practiced in the Moru area. The same source⁴⁸ reported that following discussions with youth leaders in the Jur area, she was informed that lancing the gum of children with infantile fever is very common. This is performed with a razor blade and “clear liquid” comes out. The tooth bud is not removed. They do not associate “acara” with teething. These young people all felt that “acara” was a disease and this was the only way to deal with it. The health centre could not deal with it, only the people in the community.

Ethiopia: A study on the prevalence of ‘killer canine removal’ was conducted in Addis Ababa amongst children from 300 poor families and 15% of primary canines were affected.²⁹ In 1991 there was an emigration of Ethiopian Jews to Israel, and an investigation into the practice of the removal of tooth buds was carried out. A prevalence of 59% of 59 children screened had extraction of primary tooth buds.¹⁴ In 2008, a Californian dentist examined a 3-year-old child, recently adopted from a rural area of Ethiopia, who was missing the two lower deciduous canines.⁶⁰

Tanzania: One report in 1991 looked into the regional variation of the practice of “nylon tooth” extraction, examining 1890 children from 8 different areas. The results showed the highest prevalence being in Morogoro (16.9%) and Singida (13.3%), and the lowest in Moshi (5.2%) and Mwanza (7.8%).⁵ Shortly after, a further study in the Dodoma region revealed that out of 262 children examined for missing primary teeth, 37.4% had clinical evidence.³ The authors repeated a similar study in 1997² and discovered the prevalence in Dodoma had increased to 60.3%. This confirms the fact that this traditional practice is not necessarily on the decline; in fact, it could even be increasing in certain regions.

Somalia: IOM had not been previously reported within Somali communities until a survey was carried out in Sheffield, UK of 260 Somali children aged 4 – 17 resident in the area. 31% were found

to exhibit features suggestive of a previous history of canine enucleation. 22% of these children were UK- born.⁸ Another paper details case studies of three Somali children treated by traditional healers in Somalia before emigrating to the USA.¹⁶

Democratic Republic of Congo: (formerly Zaire) Reports received in 2009 describes the practice of IOM occurring in the Kivu and Aru areas of DR Congo. According to a group of traditional healers and practitioners of natural medicine, the practice started at the time of Amin when Ugandan refugees entered Congo. They brought the practice with them and it spread among the tribes bordering Uganda. The practice is beginning to die away as people are learning that it is harmful.⁴⁸

Chad: There is a commonly held belief that canine enucleation prevents severe infections in the first years of life. An 11 year-old boy examined in France had the four primary canines removed in Chad, at the age of 3 months, by a traditional healer using a razor blade. He now had missing upper permanent canines and the lower canines were peg-shaped and hypoplastic. The parents strongly believed that retaining the primary canine buds subjected children to possible death by infection.⁴⁹

Burundi: A report from the charity, World in Need, indicates that the practice is still going on in rural primitive areas.⁵⁴

Rwanda: A 2003 report on a forthcoming oral health assessment survey in Rwanda stated that the practice of IOM was very common⁵⁵.

Immigration: There have been several reports of IOM being seen in immigrants from the above countries to France⁴⁹, Israel¹⁴, Norway⁴⁶, UK⁸, USA^{16,60}, Australia¹⁸ and New Zealand⁶⁴, which emphasises the need for dental professionals in the developed world to be made aware of the possibility of seeing its consequences in their patients.

2.1.2 The techniques of IOM

Two traditional prophylactic/remedial treatments for infantile febrile illnesses are reported in the above countries:

- 1) The parents receive herbs from the healers to rub onto the child's gums. Rural medicaments vary and there are no reports on what herbs have been used to rub on the gingiva, however, whilst in Tanzania the author was told that in Arusha they burn the leaves from the 'Myegea' tree and rub the ashes onto the gums before eruption of teeth as prophylaxis to prevent "nylon teeth".

A 2006 Ugandan study⁵⁰ was informed that a child is taken to the healer or "silencer" at a very early age before they have acquired the "ebiino" disease. The silencer uses herbs to rub on the child's gums to ensure the child never suffers from the disease. This process is termed silencing.

- 2) The tooth buds are removed using typically un-sterile implements and without local anaesthesia. Several papers report that the wounds are dressed with a variety of preparations. The following report is all too common:

*'..NMM (native medicine man) takes baby (4 months old) ...forced down by mother opening his mouth...uses a chisel shaped instrument to perforate gum and jaw bone, followed by a twist of the instrument, removing a sac which is squeezed between finger and thumb...'*⁹

Tables 3 and 4 in the appendix presents what the literature reports for treatment options / methods.

A 1997 Tanzanian study showed that in a recent survey in villages where IOM was first reported in the early 1980's, only 0.5 % of children examined had had tooth buds extracted with 32% being

treated with rubbing of herbs. Where reported in the late 1980's, 15% had extractions and only 3% herbs; and where reported in the early 1990's, 60% had extractions and 0.4% herbs. *"These results suggest that traditional healers may, over time, shift from invasive to non-invasive treatment"*. A regional variation was reported where rubbing of herbs was mostly practised in Arusha, whereas in Dodoma tooth bud extraction was more prevalent.²

2.1.3 Age that child is subjected to IOM

The age at which children have teeth removed is very much dependent on when, or if, they get ill with diarrhoea or fever. When asking parents at what age they took their child to a village healer, they most commonly reply *'when he/she was a baby'*. Deciduous canines erupt at around 18–20 months so it is usually at about this time, or before, that the tooth bud prominence can be easily palpated within the gingiva. On a 1992 study done on a Tanzanian population it was noted that there was a low prevalence of canine removal (2.8%) in the 0-12 month age group, which is probably because children are less exposed to conditions which predispose to diarrhoea as they are in the mother's 'guard' more. However, from 13-36 months old children have a more independent role spending more time playing on the ground, so contaminating their hands, and a higher prevalence of missing canines was noted (60.3%).³

However a 2005 study of 210 children subjected to IOM in Uganda reported that 23.8% had extraction at the age of four months; extractions were normally carried out within one year of birth and none within the first month of life.⁵¹

2.1.4 Clinical presentation

When a child presents with missing primary canines it is most likely to be due to him/her having had treatment for 'plastic teeth', as congenital absence of deciduous canines is very rare in African children.³⁰ The most common presentation is absence of the primary canine³ and, in a Tanzanian study, accounts for 95% of noted "nylon teeth" extractions.⁵ This prevalence was also noted in Uganda.¹¹ The majority are from the mandible, being three times more common than in the maxilla.^{11, 14, 29} This is explained as the pale eminence of the mandibular canine bud is more easily observed and palpable than in the maxilla.



Fig 1A



Fig 1B

Fig 1: Missing mandibular canine in 14-year-old Tanzanian boy (A), more commonly presented than the missing canine from the maxilla of a 12 year old girl (B). (Note also the mandibular incisal crowding in fig 1B, likely to be due to early loss of deciduous canine)

Hypoplastic / dysplastic canines are also an indicator as, when the primary tooth is being enucleated, the permanent successor tooth can be damaged. If the deciduous tooth shows signs of hypoplasia then it is probably likely to be due to unsuccessful extraction.¹⁷

In a 'post-operative' follow up one can notice severe inflammation, trismus (from swelling), lacerations and swellings in floor of mouth, remnant of charcoal powder at holes in oral mucosa,⁹ pain, bleeding, shock, inability to breast feed and/or abscess.

Other dental presentations are:

- Missing mandibular primary lateral incisors¹⁴
- Peg shaped incisors or canines⁵
- Dilaceration of primary canines¹⁴
- Retention of primary lateral incisors, with distal eruption of permanent successors¹⁴
- Displacement and impaction of permanent canine¹⁴
- Missing lower permanent incisors⁸
- Failure of development of permanent canine¹⁴
- Compound odontoma¹⁸



Fig 2A



Fig 2B

Fig 2: Lower right mandibular canine of a 16-year-old Tanzanian boy showing signs of hypoplasia due to unsuccessful enucleation, or having being indirectly gouged when primary canine was enucleated (A). As a complication the 16-year-old boy (B) has crowding in the anterior region of the maxilla due to early loss of primary teeth, and retention of primary upper right lateral incisor.



Fig 3A



Fig 3B

Fig 3A & B: Two children from the Sudan who both had a history of IOM in infancy.

2.1.5 Morbidity and Mortality

It would be extremely rare nowadays to think of a dental procedure that can carry such high risks. What we are reading about here is definitely not a dental procedure, but an inappropriately practised iatrogenic belief with consequences that can ultimately lead to further ill health, and even the death of the baby/child.

Long-term effects can include eradication and/or malformation of other primary and permanent teeth in the area.¹³

As discussed, the methods used by traditional healers are very primitive and, in some cases, the result of their treatment leads to detrimental effects.

An Ethiopian study of 1563 infants, examined bi-monthly for the first year of life, showed that milk teeth extraction was seen most frequently from 4 to 6 months of age, but seen throughout the first year. Significantly lower body weights were seen at the subsequent visit and this adverse effect was still detectable 4 months later.⁵³

Blood loss and shock due to the crude nature of the operation can lead to anaemia. The unhygienic methods can cause septicaemia, tetanus, transmission of blood borne diseases, such as HIV/AIDS, and even can be fatal.

A Tanzanian study reported that out of 124 children having had tooth germs removed by traditional healers, 10 resulted in death.¹³

In 2000, a study analysed discharge records from a paediatric ward in a Ugandan hospital and found '156 out of 740 admissions due to the effects of treatment for 'nylon teeth' resulted in death'. This gives a fatality rate of 21.1%.⁷

A study on the effect of traditional practices in Sudan reported '*an 8 month old boy had his canines removed following diarrhoea and vomiting. The operation was performed by an old woman using an unsterile nail. The child developed tetanus after 7 days and died in hospital.*'⁴ Sadly, this is not a rare example and there are numerous other stories like these.



Fig 3A:



Fig 3B

Fig 3: The baby in (A) has missing baby teeth. (B) - this baby died of septicaemia shortly after this photograph was taken. The hospital doctor reported that she had had her baby teeth dug out with a bicycle spoke by the village healer.

Section 3: Planning a Strategy

The review of the literature has provided us with information on IOM to give a more detailed understanding on the practice, and highlights clearly the need for a strategy to be put in place. One of the major factors to consider is our need to know more about how the culture in these countries plays a huge part in strategy planning. We can learn from our own anecdotal reports and from the

literature, and below are interesting facts documented from previous studies that will give the reader further valuable information:

3.1 Status of the Traditional Healer/Traditional Birth Attendant (TBA)

A study in 1987 estimated that Tanzania had a total of between 3000 to 60,000 traditional healers with potentially 8000 people consulting them daily.³¹ This implies that even with more modern health facilities being available, the utilisation of traditional medicine is scarcely affected. A report from Tanzania discusses the difficulty of changing beliefs of healers as they are held in high regard in society - *'to the majority of the people they are among the most competent authorities they know'*.² This may explain why, despite several interventions condemning the practice (such as public addresses by political leaders, health education messages, the arrest of traditional healers by police), sporadic epidemics of the practice continue to be reported in different regions. The village healer also has financial incentives for carrying out the practice, and will put pressure on the parents in order to make money.¹² Parents can lose faith in the hospital system when a child is ill so will seek local doctors and put more faith in traditional medicines. A report on village healers in Tanzania concluded that their knowledge on oral health was very limited.³²

A 2006 Ugandan study⁵⁰ found that the healers or "extractors" learn the trade by observing other extractors; sometimes the practice is handed down the generations. It is done as a means of income and the extractors receive no formal training and are not registered with the Traditional Healers and Herbalists Association.

A Kenyan study in 2010 reported that although the practice traditionally is done by old men and women healers, TBAs who might have learnt from them are the main proponents and beneficiaries of the practice. It is their main source of livelihood, being paid in cash or in kind. It is a belief that whenever a bone is broken or blood is shed, payment must be made to the TBA to ensure that recovery is quick and not followed by a "bloodshed curse".⁶³

Should we be targeting the traditional healer? If so, how?

3.2 Who believes in the practice?

The literature highlights that well-educated people also believe in the practice. A 2007 editorial from Tanzania reported how some dental practitioners and dental students believe in 'nylon teeth'.³³ When the author, J Gollings, was screening schoolchildren in Tanzania the headmaster had allowed the practice to be performed on his children and the biology teacher was enquiring about the 'science' to 'plastic teeth'. This surely emphasises how strong the belief is and the sensitive approach needed when educating on this false belief.

3.2 Where is it carried out most?

Regional distributions for reporting on cases where IOM has been carried out vary within any of the reported countries. The general recurring theme is that reported cases are more common in rural than urban areas.¹⁴ Even still, within urban areas there are pockets of communities that will have a traditional practitioner that they will consult. This knowledge is surely crucial when planning where it is most appropriate to target populations with 'highest need'.

3.4 The role of the mother

The role of the mother is commonly mentioned as she analyses the problem with her child and discusses it with other mothers. A mother is responsible for noticing changes in a child, and will usually ask an elderly woman, preferably the mother in law, for advice before initiating treatment.²⁶ However, with regard to 'plastic teeth' they will usually seek advice from another mother whose child has had the condition (since it is regarded as a fairly 'new' problem). Targeting the mothers for health education would seem an appropriate method, given how they all share 'stories' and experiences, but culturally one needs to be aware that the final decision for a child's treatment lies

with the father, the mother being the one that 'recognises' a problem. So, who is more appropriate to educate about 'plastic teeth? The mother, the father, or both?

3.5 How can we change belief?

'Plastic teeth' is reported over a vast geographical region, and evidence points to the fact that it has happened over a period of only recent decades. When studying the 'social' implications behind 'false teeth' one author concludes that '*often it is 'practice' rather than knowledge and explanations which move freely and travel far.*'²⁶ which has implications, as often it is believed that it is a change of knowledge (e.g. education programmes) that precedes a change of practice. Are education and trying to influence behaviour through knowledge the best way when designing our strategy?

When looking at why a belief may be so 'deep rooted' we have seen reports on how historical events (such as wars being blamed); social factors (such as pressure on the mother to be seen to need to find a 'cure' for an ill child); and the significant role that a traditional healer has in community can be attributed towards a reason. However, the literature raises a recurring theme for there needing to be a 'belief', an 'answer' as to why a child is sick. The fact that an illness such as diarrhoea is so common suggests that there should be a 'physical' reason. The average child in Sudan will suffer from diarrhoea three times a year, being the leading cause of death in children.³⁴ So it comes with no surprise that when asked 'what the cause of this diarrhoea may be', 90% of mothers asked replied, 'false teeth'. After all, every child will develop teeth and is likely to get diarrhoea / febrile illness at a similar time, so why not believe that they are both linked? If you were to know no different then it isn't the worst common sense to put two and two together. Should we be thinking that a holistic approach is necessary when planning an education tool? Do we need to mention why teeth are 'not' the cause, but emphasise more that dehydration 'is' the cause and educate appropriately?

3.6 Future Research

Without spending many years within these communities it is impossible to say that we will not encounter more cultural 'insights' that help us learn more about appropriate elements for a strategy. Another area to consider is the issue that there is reported evidence that communities take their beliefs with them to new settlements. In the western world there have been several reports; a Ugandan family treated at the Eastman Hospital, London:¹⁶ Somalis at Sheffield Hospital and at the University of Oslo, Norway,^{8, 46} and even a case presented in Melbourne recently of a Sudanese boy with oral complications from IOM.¹⁸ Clearly there will be specific strategies necessary dependent on which country is being targeted. With regards to there being evidence for the actual practice being carried out in the UK, further studies are necessary to determine this.¹⁷ Is this an avenue that Dentaaid needs to explore? Is there a possibility for further research to be done in this area?

3.7 The Experiences of Others

From the literature there are some papers that relate specifically to previously carried out strategies, analysing their success. We need to learn from these what worked, and any limitations the authors may have expressed as to why or how something could be done better or differently next time.

1. A 2005 study in Uganda analysed the success of an education programme involving role-plays, didactic presentation and discussion workshops. The success was measured by noting a decrease in hospital admissions relating to IOM 1.5 years after the programme.³⁵ Its author concluded that the project worked because the underlying belief is that the practice is harmful; there is becoming an increase in trust in western medicine as there is more exposure to it; and some local healers had an unfavourable reputation. They also learnt from the exercise that both men and women should be targeted due to the role of the male in family decisions. It is also crucial to create a project that can be sustainable by allowing the community to have a contribution in designing and

maintaining the project. Public health textbooks would refer to this as 'empowering' people, and it is something that needs to be considered.

2. In a 1983 report it was suggested that health education should be 'enforced by dentists and medics', with the emphasis being aimed at the 'harm caused to children'.¹³ This author produced other articles on "nylon / plastic teeth" in Tanzania, and this recommendation is more of an opinion than evidence-based proof of it being the best approach. However, the experience of the author with the culture is crucial and being direct about the negative aspects of IOM should be considered.

3. In Uganda in 1983 there was a massive education programme implemented that consisted of radio broadcasts and education in antenatal and other departments in the hospital.³⁶ The approach was aimed at 'stressing the complications of IOM'. Four years later they reviewed this 'education initiative' and noticed that there was an increasing number of babies being brought to the hospitals with complications of 'ebiino'. In other words the community took on the information about 'complications' but it did nothing to alter their behaviour, even though they had better knowledge. They still allowed the practice to be carried out on their children, but would bring them in when complications were shown, therefore this programme was not a true success! The author learnt that we need to have more confidence in the mothers' capacity to understand, so advised education to be aimed at how teeth develop. This is valuable information as the programme was followed up to measure if it had been a success, highlighting the need to critically assess our own strategy. Also we can learn that a direct approach is favourable when wanting to influence behaviour.

4. A 1999 report by the dental officer in the Tororo region of Uganda took the angle of not pointing blame at the traditional healer; after all they will always be a crucial part to delivery of medicine, so it is best to support them. The approach was to educate them on methods of sterilisation, methods of extraction, complications of extraction and cross-infection control, therefore working alongside, allowing 'belief' to continue, but seeing a change in the way it is carried out. By this sensitive approach there were positive results in an increase in 'appropriate referrals', and more use of herbal medicines.³⁷ Although there is no quantitative data from this, there is evidence that education and discussion with traditional practitioners can markedly reduce the practice of 'nylon tooth' extraction. As western practitioners it is wholly appropriate to be sensitive to local culture and practices when designing a strategy.

3.8 Planned Interventions

A 2007 editorial describes how students at Muhumbili Dental School were planning to take on issues relating to IOM and wanted to see some changes made.³³ *'They recommended that the community must be educated constantly through different fora so that ultimately the myth could be eradicated'*. The following propositions were made:

- Information on 'nylon tooth' myth to be provided regularly by graduate dentists to patients in outpatient department.
- To make education against 'nylon tooth' myth a permanent agenda in elective programme.
- To educate dental nurses in dental school and Muhumbili National Hospital
- To network with the MoH as an alliance

These recommendations bring to our attention that there are already groups in target areas that actively want to do something about the 'nylon tooth' myth. As an NGO, DentaId needs to consider working alongside these and any other similar groups with the same vision, as they are an invaluable resource for our work.

Should part of our strategy be aimed at facilitating the work of this group? If so what ways could we help each other?

Appendix for Section 1-3

Table 1

Removal of teeth	Country
Dental Mutilation	Uganda ¹¹ Tanzania ^{5, 13}
Primary canine enucleation	UK ⁸ France ⁴⁹
Deciduous canine tooth bud enucleation (DCBE)	Kenya ⁶³
Germectomy	Uganda ²⁶
Lugbara teeth extraction	Sudan ^{4, 12}
Tooth bud extraction	Tanzania ³ Israel ¹⁴
Haifat (lancing of the alveolus over the deciduous tooth)	Sudan ²⁸
Ibino Ebino/Ebiino Ebinyo/Ebinnyo	Tanzania ² Uganda ³⁷ Uganda ³⁸
Canine follicle extirpation	Africa/Arabia ³⁹ (Australian term)
Tooth bud gouging / enucleation	UK ¹⁷
Infant oral mutilation IOM/ dental ablation	UK ^{40,41,42} USA ¹⁹
Killer canine extraction Geg Milk tooth extraction	Ethiopia ²⁹ /Uganda ⁵¹ Ethiopia ⁴³ Ethiopia ⁴⁴

Table 2

Alternative term for "tooth worms"	Country
Lugbara/Lugwara teeth Kala ti lugbara Wood wakey Azara Kakorok/Kakulyak Lagbir Achara/acara	Sudan ^{28,4,12,48} <i>(Pojulu people)</i> <i>(Nufa people)</i> <i>(Mundu people)</i> <i>(Kakwa people)</i> <i>(Dinka Bor people)</i> <i>(Moru / Jur people)</i>
Plastic teeth Lacmarach (False teeth) Kelek ab oik (Devil/Satanic teeth) Abua (Devil teeth) Ebisara (Devil teeth) Dents de refugees (refugee teeth) /plastic teeth/ false teeth Meno plastique/ Meno ya warefugee	Kenya ¹ Kenya ⁵⁹ <i>(Kalenjin people)</i> ^{57,59} <i>(Maasai)</i> ⁵⁸ <i>(Kisii)</i> ⁵⁸ DR Congo ⁴⁷ Dr Congo ⁴⁸
Nylon/Plastic teeth Lawalawa Meno ya nailoni (nylon teeth); Meno ya plastiki (plastic teeth); Ibino	Tanzania ¹³ <i>(Sindiga region)</i> Tanzania ⁴²
Two lak/Telak/ebino/false tooth Gidog Ebinnyo/Ebinyo Ebino/Ebiino Bino Lake jo marak /Lakijo marach (bad teeth) Ikela/Icela Gira kwanya (that which is removed); Ebiharahano; Ebyomukanwa; Ebikoko byomukanwa; Ebyyakaragwe; Ebinyamaishwa; Ebinyangondokyera (snails)	Uganda ^{36 37 45} Tribe: <i>(Acholi)</i> <i>(Lango)</i> <i>(Luganda)</i> <i>(Runyankole)</i> <i>(Lusoga)</i> <i>(Japadhola)</i> ²⁶ <i>(Iteso)</i> <i>(Jop'Adhola)</i> ²⁶ Sub-counties: ⁵⁰ Bwongera, Ihungfa, Itojo, Kayonza, Nyakyeru, Rugurama, Ruhama
Killer canine	Sudan ¹² Ethiopia ²⁹ Uganda ⁷
Ilko-dacowo (fox teeth)	Somalia ⁸
Tooth worm	Sudan ¹⁸

Table 3

Instruments used	Country
Piece of iron Hooked iron bar Razor blades; penknives; nails; bicycle spokes; fingernails	Sudan ^{10,4,12} Chad ⁴⁹
Sharp, heated instrument to lance alveolus	Sudan ²⁸
Pointed penknife Sharp thorn of the orgosua tree	Kenya ¹ Kenya ⁶³
Knife; bicycle spoke; rusty wire; nail	Uganda ^{7, 50}
Hot nail	Somalia ¹⁶
Knitting needles; scissors; broken glass	Uganda ³⁵

Table 4 – to show what types of dressing have been used either prophylactically or post-operatively.

Post-operative wound dressing	Country
Charcoal powder	Sudan ⁹
Ashes of herbs; lizard faeces; crushed antibiotic; sulphur capsules	Sudan ¹²
Warm poultice of butter, mustard and garlic	Ethiopia ²⁹
Salt; sodium bicarbonate; herbs; sugar solution	Kenya ¹
Herbs; locally prepared medicinal powder	Uganda ⁷
Honey	Kenya ⁶³

The social course of the “false teeth” belief in Uganda

In 2000, Mogensen published an excellent paper on the way in which the notion of “*false teeth*” is shaped by national forces of war and poverty as well as local influences.²⁶ It is based on fieldwork in Tororo district, inhabited by the Jop’Adhola tribe.

His paper is quoted here to aid the reader to further appreciate some of the complex factors involved in dealing with the eradication of IOM.

“In eastern Uganda one out of six children dies before its fifth birthday and with a birth rate of almost eight children per woman most women have lost at least one child, and some several children..... Not only do many children die, but the first years are a constant battle for the mother to keep the child alive. The major diseases are malaria, diarrhea, respiratory infections, measles and nutrition-related problems. All children are regularly sick, suffering from inevitable recurring diarrhea and going through numerous malaria attacks....

“*False teeth* is said to cause death.... Ideally, the removal of *false teeth* should not prevent actual teeth from appearing, and the fact that it sometimes does has caused dissatisfaction and concern among many Jop’Adhola mothers, who often mention this as the reason they prefer practitioners who merely make a small cut or know how to avert the danger simply by rubbing the gums with a certain herb.....

False teeth “is of serious concern for the mothers and (one) mother was so worried about her daughter that even though she started out by making ‘Luck’ a part of the child’s name, she ended up putting it in brackets... There is no doubt in people’s mind that *false teeth* can kill.....

“*False teeth*” is an inevitable part of life.... Some would claim that all children are born with it...Another explanation is that when a pregnant mother steps where somebody threw the remains of *false teeth* removed from another child, her own child will become infected...

“*False teeth*” is not something that brings people to the formal biomedical system. The practice of removing the teeth is condemned by the formal health care system, and in some areas it has been part of health education for years to make people stop the practice...

“A kind of practitioner has evolved who treats *false teeth* as well as other conditions...with a mixture of herbs and ...pharmaceuticals as well as ‘technology’.”

One such practitioner, a primary school teacher, gave this account of his treatment:

“*False teeth*” is actually caused by a maggot. When the maggot has developed it will have to eat that place where the tooth should be, and all the time such a child who has that *false teeth* coming out will have to bite the mother’s breast, seriously, and that is when you detect that the sort of teeth that is coming out is not proper, and that the maggot will have to infect all the veins all around here {indicating the face and the forehead}. Now, this thing that comes out like this one, *false teeth*, it goes up to the brain, before it reaches the brain it has to end up somewhere where there is a hole {indicates the fontanelle} and when that one is infected with malaria the maggot is now stimulated to do what? To worsen, in the teeth – so that these teeth have to bring a child to death point. That child can die, it is serious malaria... That thing gets really swollen, a yellow fluid enters, and that yellow fluid comes from hard work when a woman is pregnant... you get your tool to pierce it, the fluid will come out fast, and having removed that you will see blood... You will find that the child gets cured. I mix those two medicines {fluid penicillin and fluid chloroquine} there, and give injections to stop diarrhea and to stop fever... and the other one, this one {a herb} stops diarrhea.”

“The treatment get at the health centre is strictly symptomatic. A symptom is mentioned and the corresponding drug prescribed... Most people go home without any understanding of what is wrong with them or their children, what to do now, how to take the medicine and how to prevent a new occurrence of the disease.

“When a mother goes to the health unit with a child who has had diarrhea on and off for weeks, she does not mention *false teeth*, because she knows it is not dealt with by the health care system.

False teeth, dealt with in the domestic sphere and with informal practitioners, indirectly becomes not an explicit critique but a comment on the limitations of these formal health care services.”

Mogensen H O. *Culture, Medicine and Psychiatry* 2000: 24: 331-351

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