FEW TIPS FOR MAKING GROUND SECTIONS OF TEETH FOR RESEARCH PURPOSE

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Abstract

The importance of dental identification increases within the last years due to mass disasters as a result of natural phenomenon such as cyclones, earthquakes, floods and volcanic explosions and airplane accidents, industrial accidents and terror acts. Teeth are becoming an important part in many fields related to Forensics and many medicolegal solutions are possible just by studying teeth. In my study, I used ground section of teeth to estimate age of person above 25 years and the procedures I adopted and the difficulties I came across while preparing these ‘ground section’ of teeth are being highlighted in this paper.

Introduction

The need for accurate techniques for age estimation has never been grater than last two decades because of two main reasons related to current socio-political development. The first reason is increasing number of unidentified cadavers and human remains; the second reason is rise in cases requiring age estimation in living individuals with no valid proof of date of birth [1].

There are many methods to look for anatomy of teeth and depending upon method various type of sectioning is adopted. There are several factors which can determine exactly how a tooth thin section is lapped and/or polished, including the shape, thickness and the intended use of the sample.

The mounted crowns were progressively sectioned using a diamond saw and those showing stain penetration were examined. In the western countries where latest instrument are readily available at hand, research in developing country do sometime lack behind due to lack of these instrument or cost barrier.

Similar if section of teeth is to be prepared, there are many methods like microtome section of decalcified teeth and then stained with haematoxylin [2,3]. However some author suggested that this procedure of sectioning is often too harsh for archaeological remains and other researchers have found that decalcification tends to produce macerated sections in archaeological material [3], thus the purposes of most of the study, the teeth should not be de-mineralized.

Ground sections are the section prepared without using any chemical and thus maintaining normal anatomy and constituent. Usual method adopted and given in various literatures is enlisted below.

For examination of a tooth, the teeth are first soaked in 20% formaldehyde for 24 hours, washed in water. Then sectioned can be made using one of the following methods:

- Tooth could be sectioned to any thickness by using ultra-microtones with diamond cutting blades (e.g. Buehler Isomet low speed saw with a diamond impregnated blade)[4]
- Using burrs of various sizes available, teeth can be grinded from both sides equally thus making a thin ground section. However this method had a disadvantage that the use of burrs may alter

normal anatomy of the teeth.

- By hand grinding is done manually. Manually grinding was done in two steps, first with rough carborundum stone till a section of 2 to 3 mm was obtained and then on static carborundum stone with hand till the thickness is 1 mm. Grinding was further done using fine carborundum stone till the section of 0.25-mm thickness was left. Finally cleaned and dried section is mounted on slide using DPX and viewed under microscope.[4]

Main problem faced using the above methods

- As already said our research is cost restricted, with no such availability of ultra microtones with diamond cutting blades.
- Burrs had their own disadvantages that they led to some anatomical changes while teeth are grinded.
- Hand grinded was best suited for our setup as instruments used in this method are low cost as well as easily available but there were some restriction in using this method also. These were that carborundum stone available used by dental surgeon was of 4 to 5 cm diameter and grinding of teeth on this small surface was not possible. Use of hands in grinding was really injurious to the fingers as with the decrease in teeth size, finger was also rubbed on the rough surface which led to the injuries.

To overcome the problem we tried many alternatives and came up with method which is described here. Although this could be not the only alternate method but still it was very helpful for us and helped us to prepare grounds sections of 100 teeth.

Apparatus used

The apparatus used for the study were Extracted teeth (Treated with formalin), Lathe (with two speeds), Rough stone used for sharpening instruments by mechanics (Figure 1), Paris powder

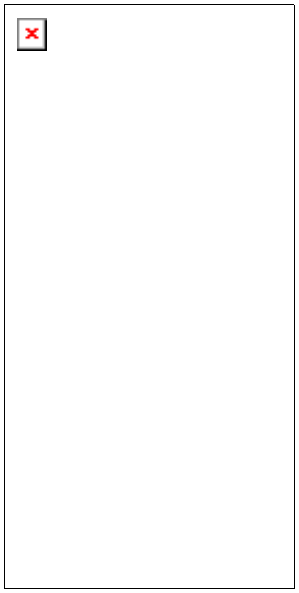


Figure 1

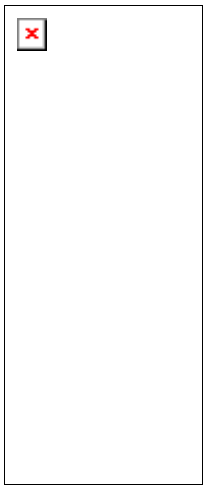
Method used

After extraction of teeth from the socket using premolar extraction forceps, tooth is kept in formalin for about 24 hours. Then tooth is washed with water and ground section was prepared by following method.

Preparation of the ground section:

For making ground section, hand grinding method was used. Hand grinding was done manually first with use of lathe stone fitted on the motor. The tooth was kept along the lateral surface of lathe and the tooth is grinded till it is 4 to 5 mm thick. A constant spray of water as well Paris powder is required to be sprayed on grinding surface while grinding. Paris powder prevents irregular grinding of tooth and water help to cool as tooth get heated up due to friction of grinding. Then further grinding is done at slow speed of lathe till the section of 3 to 4 mm thickness is obtained. After this grinding is done using a stone (Figure1) used by mechanics to sharpen their tools. This stone has two rough surfaces one course and one slightly smooth. Tooth is first

grinded on more surface and water as well as Paris powder is constantly poured on this stone while grinding. Tooth is grinded on this surface till the thickness is 1 mm. After this grinding is further done using finely rugged surface of the stone till the section of 0.25-mm thickness was left. Finally cleaned and dried section is mounted on slide using DPX and viewed under microscope.



Ground section slide prepared

Conclusion

1. Dental lathe is useful for the initial grinding of tooth till the thickness of 4 to 5 mm.
2. Rough stone used by mechanic is as good alternate as well cheap alternative for grinding of tooth for making ground section of tooth
3. Although hand grinding is tedious and injurious method but is not replaceable with any method.
4. Instruments used are readily available as well as cost effective too.

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