



Forensic Odontology

Forensic Odontology :

- forensic originally comes from the word Forum (in the 17th century a forum used to be the public place where people gathered to witness the judgement in case of accusation).
- Forum = منتدى , نادي
- Forum = a place where people gather to discuss something.
- Court hearings are ALWAYS public.

The Jury : are 10 people that are not related to law , and don't know the suspect , that sit in court and just listen to the deliberations that occur and then they determine whether the suspect is Guilty or not.

- Why should they only be 10 ? They are only 10 , because the more people you have the more likely someone from the jury might know the suspect.
- Why shouldn't the jury be related They should not have any idea about law , (naïve people) because they will depend only on their internal feeling whether a certain practice is right or wrong.

The judge has more experience , he / she might be more bias because of the appearance of the suspect or their background (if the suspect is a homeless drug addict who had a previous criminal crime the judge will more likely determine this suspect guilty).

A judge has more experience so they will be able to determine the strength of the evidence better than the jury .

Since the jury are naïve they will probably believe it when a forensic investigator says that a certain gunpowder they found matches the suspect's gunpowder , but the judge will know that this is not always true so the judge will ask the investigator " what is your probability of error " ?

The jury will determine whether a suspect is guilty or not , the judge will determine the penalty.

The judges are always an odd number (1 ,3, 5 or 7) this way they can never have a 50/50 disagreement.

What determines the number of judges ? the level of the court .

Ex :

- for minor disputes like (traffic violations or verbal disputes) → 1 judges
- Murder and more complex situations → 3 judges
- Attacks and very sensitive cases → 5 judges



Forensic medicine :

Autopsy = Auto means self and -psy is to see (to see for one self)

Sometimes you have to do an autopsy even if the cause of death might look obvious .

Ex : a car crash , an autopsy might reveal some scratches on the neck that are inconsistent with the crash injuries and then when you examine the blood you might see elevated levels of Co2 which might turn your thinking towards suffocation rather than death because of the injury.

Forensic dentist :

Roles :

1- Identification of bodies

You need to identify bodies to :

- A. Give the families closure
- B. Have accurate records of who is dead and who is alive
- C. Identify the victim to know the killer (**In most homicides the killer is usually someone known by the victim.** So if you identify the victim you can have the lead to know the killer)

Nails are collected from the victim's body and sent to the lab , so if a foreign DNA is found this means the victim was mostly is near proximity with the killer .

- 2- Fractures of the teeth or bone , and lacerations found on the lip or other oral soft tissues might indicate that the harm or death was intended .

Every filling is unique – because each filling follows the extent of caries which is very random.

Why use teeth in identification:

- 1- Teeth's enamel is resilient: since it is made of hydroxyapatite crystals which can withstand extensive trauma and heat.
- 2- dental treatments are unique

For fingerprints you need 12 concordance points to compare it with the fingerprints in the crime seen. (12 points must match between the 2 fingerprints)

In DNA you need to match 15 concordance points or loci (Loci , are genes that don't translate into anything)

For teeth you don't depend on a certain number of concordance points . for teeth you unlimited number of concordance points .

The antemortum finger print source – ID fingerprint , or anything that the victim used before died (but other people might have used it as well so you will have other fingerprints)

Antemortum DNA- tooth brush , pillow , clothes , hair brush (but again those things can be shared by someone else)

In teeth you can't share a filling with someone else ! antemortum dental records can be obtained from dentists



If a plane crashed , you get the list of the people on that plane and contact their relatives and ask them the following.

- 1- Do they have anything that has the victim's DNA

A plane crash in a deserted area – closed disaster (the number of victims is either equal to or less than the number of passengers)

Tsunami (natural disasters)- an open disaster (the number the bodies doesn't equal the number of missing people)

A plane falls onto a village - open / closed disaster (you have an element of a closed disaster which is the list of missing people and the element of open disaster since you can't calculate the number of people in the village)

In Some countries the law forces the dentist to keep accurate dental records for a specific period from the last dental treatment .

Weak evidence : (but is still better than no evidence)- but you need to say that this evidence is weak.

- A verbal statement or a photograph is a record
- Burn marks
- Clothes
- watch

If you don't have a dental record for a missing person , you can either identify that person by exclusion. Or you can depend on verbal statements for the family or close relatives or social pictures to identify a person (the picture might show a chipped tooth or crowding , the verbal statement might direct you towards knowing that a certain tooth had caries , if the family says that their missing relative had sever pain and food stagnation on a certain tooth)

Identifying age from teeth :

- U can identify age from teeth until the age of 15 years . (untill the root of the lower second molar is completely formed)
- You depend on the lower molar because it appears more clearly on an Xray while the maxillary molar has a lot of superimposition.
- You don't depend on third molars because they might be impacted or missing.

If the patient visited more than one dentist – you need to get records from each dentist and create a compound record .

Compound record : the record that you make from all the information collecte from all the dentist that reated that person with certain information that are important with the last treatment being the most important.



Or if the family doesn't know the dentist you might check the dentist that is in close proximity to the victims's house.

Evolution of dental treatment : if someone has a record of a filling on a molar , then a few l

The pulp is useful for identification -> a source of DNA

Compatible / explainable inconsistency : It is possible for fillings to grow bigger in postmortem records.

If the antemortum records show an occlusal filling , but the postmortem records have an occlusomesial filling . (this is explainable because maybe the victim had secondary caries under the restoration and had to go to another dentist to remove the old restoration and put a new one) but this is a weak evidence .

If there are no xrays to compare or if the victim has no restoration and perfect teeth you can look at strange things or percularities like (weird roots and strange looking teeth)

In dental forensics you have a wide variety of records (casts , xrays , financial bills)

Even if the dentist doesn't write anything , the invoice will have a code that indicates what the dentist did.

The weakness of the poor record keeping by dentists is compensated by the wide diversity of records.

Even if you don't have anything to compare at all , you can narrow down you findings according to age.

4 criteria for dental aging :

1-

4 criteria for each tooth

In the chart :

The collection of the DNA samples was quick to prevent decomposition but retrieving the antemortum records of DNA was hard and took a long time . that's why the identification using DNA and FP went up by the end of the chart.



Violence :

Ulceration with irregular borders → trauma

Ulceration with regular border → pathology

Adult : reluctant to answer questions about the trauma.

Traumas can be :

ekymosis on the palate → caused by strangulation (or it mght be excessive coughing)

broken teeth

facial signs : bite marks and ekymosis in the clear of the eye (can be caused by strangulation or anging in attempted murder or suicide)

4 types of violence :

- Physical
- Physcological
- Sexual
- Neglect

Intentional injuries (non accidental):

1. most common site of injury is the head
2. violence must be suspected in all cases of injuries to the head
3. appropriate documentation and reporting should take place
4. beware of wrongful reporting.

Physical indicators of violence :

Injuries are away form bony prominences (cheek injuries)- injuries from falling must be on the chin or other bony prominence.

Injuries inconsistent with child's age related activities

Evidence of neglect – multiple carious lesions , dirt clothes dirty nails and fungal infections , lice in hair

Injuries appears in groups or different ages – injuries on multiple areas

Behavioural indicators of violence :

History is vague and inconsistent with clinical findings

Delay in seeking medical / dental help

No witness

A sibling might be blamed for causing the injury (usually the younger one)



Repeated attendance to healthcare facilities

Disturbed child

Parent becoming angry when questions are repeated or clarification are sought

Parent refusing to leave the child alone.

One indicator is not enough to say there is violence

A significant injury is an injury that will cause disability for a period of a few days

An exception to breaching patient confidentiality is : reporting to prevent a crime or reporting a crime .



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