FORENSIC TEAM 431

LEDARES

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Human identification

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CRIME SCENE - DO NOT CROSS CRIME

■Slides ■Doctors notes ■Additional

Human identification

Definition

- The determination of an individual, weather dead or alive, using certain physical characteristics.
- relate a sample to: "Database ex: finger print , Single template ex: DNA "
- It could be complete or partial

When we need Human identification?

In:

-Mass disasters ex: tsunami -Mass graves ex: Bosnia -Homicides and suicides

-Absence of documents -Unknown offender -Criminal responsibility -Identity theft

Why we need Human identification?

1-Human right

2-Identification of offenders

3-Insurance benefits to next of kin

4-Age determination in criminal liability

5-Interchange of newborn babies in hospitals

6-Personal identification

7-Criminal identification 8-Legal identification

9-Civil identification

10-For burial purposes

IN THE LIVING: By using:

-Trace evidence ex: blood ,semen, finger print

-Functions ex: voice recognition, gait

-Age estimation

Human identificatio

IN THE DEAD:

The body may be:
-Fresh and intact "easier"
-Putrefying -Mutilated
-Charred -Skeletonized the role of physician is to recognize how many individual were there, Is it the bone of one body or several bodies, Are the bones of human origins or animal

How?

•Anthropometry (Greek anthropos "man", metron "measure") refers to the measurement of the human individual.

•Descriptive ex: tattoos, rings, hair, race

•Photograph •Dactylography "Fingerprints" •Hand prints •Ear print •Vein outline •Lip prints •Bite marks •Teeth •Foot prints •Voice recognition accent, بحة

•Gait

•Thermal print people leave a thermal print even after they leave the room, they are some devices they can tell how many people was in this room ,when and where did they set. Sometimes they can find finger, hand ,foot using thermal print.

•Iris recognition is an automated method of biometric identification that uses mathematical pattern-recognition techniques on video images of their ides of an individual's eyes, whose complex random patterns are unique and can be seen from some distance.

•DNA

Dactylography

Definition:

It is the print of the patterns of epidermal ridges on finger tips on a surface

The method of identifying these prints is called Dactyloscopy

Characteristics:

•Unique to the individual even twins have different finger prints although they share same DNA

•The patterns remain unchanged throughout life

Types of fingerprints


Arch


Loop


Whorl


Tented arch

-When friction ridges come into contact with a surface that will take a print, material that is on the friction ridges such as the natural secretions of sweat from the endocrine glands, perspiration, oil, grease, ink or blood, will be transferred to the surface.

-Children's fingerprints are considerably more short-lived than adult fingerprints. The rapid disappearance of children's fingerprints was attributed to a lack of the more waxy oils that become present at the onset of puberty. The lighter fatty acids of children's fingerprints evaporate within a few hours

Validity

the subjective nature of matching, despite a very low error rate, has made this forensic practice controversial.

Absence of fingerprints:

1-Medical condition:
- -Adermatoglyphia
- -Some forms of ectodermal dysplasia

2-Medications:

-The anti-cancer medication ”capecitabine”
-Bee stings

3- Age
the ridges get thicker; the height between the top of the ridge and the bottom of the furrow gets narrow, so there is less prominence

4- Mutilation: (is an act of physical injury that degrades the appearance or function of any living body)

-Burning the fingertips, using acid -Plastic surge

Hand print

The whole hand has unique characteristic for individual

Foot print

Can be shoes

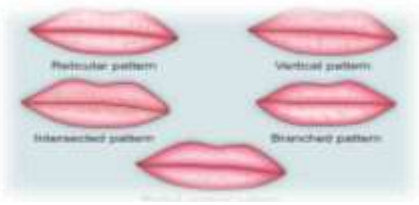
Ear print

There was a murder they could follow the footsteps of the killer because there is blood on it with the cctv camera they went to the house of that killer ,they found clothes has blood on it from the victim they found the shoe they found everything that arrest this killer but he said I didn't do it and then they his shoe and cut it to expose the sole and they took special picture and they could recognize tow prints inside the shoe old one of that Innocent and new one of his friend who were his shoe and went to comet the murder

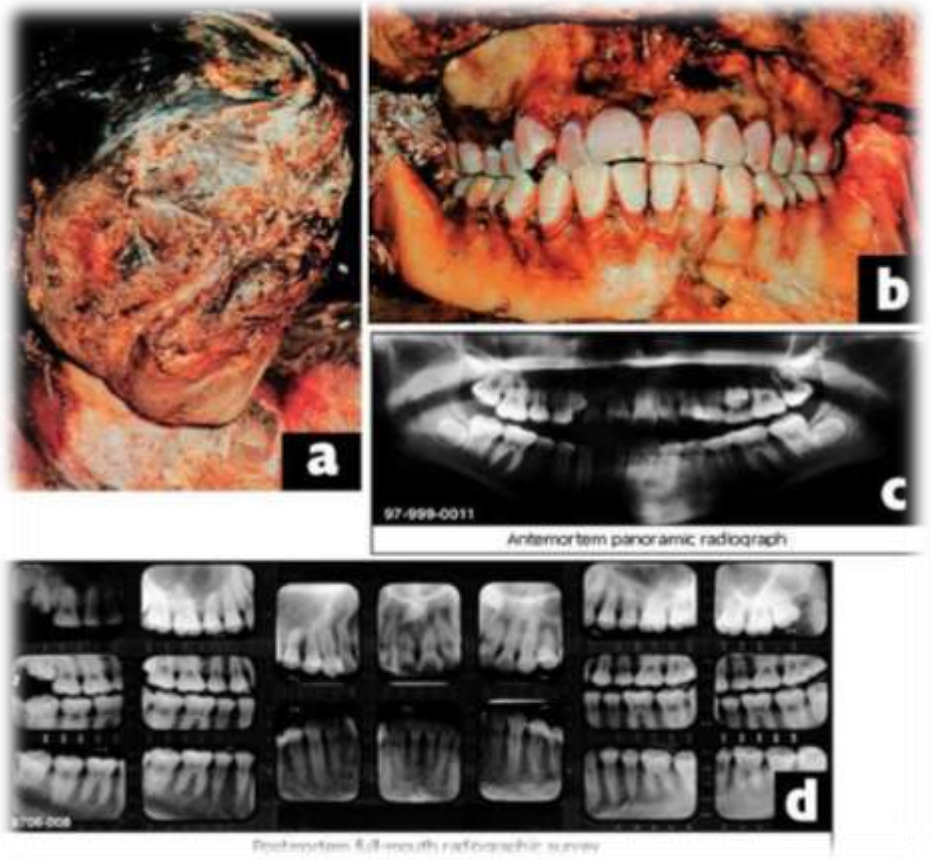
Vein outline

There was case also of pedophile who use to take pictures of him molesting those children but the face is never in the picture is always his hand, they had suspect but they couldn't prove it so they took all these picture and went to the anatomy department and they ask them if they can give them any evidence from those pictures and one of the picture the vein was very visible and they said: are these shapes of veins and branches is it unique for individual. So they did huge study to determine statistically if these are unique to the individual and they found they are unique and they could arrest him

Lip prints and Bite marks



Teeth



DNA

The molecule of DNA has two strands of sugar and phosphate molecules that are linked by combinations of four bases –adenine, thymine, cytosine and guanine –forming the double helix of DNA.

Only about 10 per cent of the molecule is used for genetic coding (the active genes), the remainder being ‘silent’. In these silent zones, there are between 200 and 14 000 repeats of identical sequences of the four bases.

The technique of determining the sequences is extremely complex, relying on cutting the DNA strands at predetermined points by the use of restriction enzymes. The fragments of DNA are separated using electrophoresis and the different fragments are then identified using a radioactive probe.

From the presence of different bars in given positions, comparisons may be made with other samples, known or unknown –the classical forensic ‘comparison technique’.

The problem with DNA is very expensive and takes long time. the price of one test is around 3000 pound and they need one from victim , scene and several from the suspects but is accurate , its link the person to the place. Now they can detect DNA from small sample

At least 2 identification markers should be noted by the doctor in all medico-legal cases

Age Estimation

- Relate chronological age
- To biological age
- Using known specific maturating events

How to estimate age

•Select a feature of the developing individual that:

- Grows/matures over a long period of time
- Measurable stages
- Over a short period of time

•Stable •Survives inhumation well •Stature/weight •Sexual maturation •Bone development the problem with these systems that they are highly affected by the environment and racial differences ex: an 8 years boy in Germany different from an 8 years boy in India

•Dentition: is the least influenced by environmental factors and survives inhumation very well.

Dentition as an estimate for age

-Deciduous/primary dentition
-Permanent

Tooth development

initial mineralization, crown completion, and completion of the root apex.

Age estimation from bones:

•Foetusand young infant:

Look at the appearance of ossification centers in growing cartilage (complete by 5 years)

• Child to young adult:

Look at fusion of the epiphyses (secondary ossification centers (up to 25 years))

•Adult > 25 years: Look at wear and tear changes in teeth and bones.

Facial reconstruction

Was first done in Russia were they Measure the thickness of the soft tissues.

is very helpful in case of fire and now software help in doing the facial reconstruction rather than relying on hand made

Questions "429 MCQ"

1-Regarding identification, the following is true:

1)There is no way to identify people with severe postmortem changes.
2) Tattoos are the most credible way to identify a person.
3)Visual identification is rarely used.
4)Tattoos are never used by Muslims.
5) A positive identification means that the person is identified "Beyond a Reasonable Doubt.“
a:5

2 - What are the issues regarding identification?

Lose of some of the 8 Body Parts Forensic Scientists Use in identification a
Body can be an issue that may prevent us from properly identifying the body
These parts are:

1. Fingers

   Fingerprints still continue to be the most universally used forensic evidence around the world. In most places, fingerprint examination cases out rank any other forensic examination casework totaled. It increasingly has grown to be the most respected method for identifying persons

2. teeth

   Forensic dentists can use teeth for identification or in some cases a single tooth can be used. If no dental Xray is available, digital photographs can be taken of the teeth to compare to a smile in a photograph during the victim’s lifetime. These dental examinations are quite often key in identifying an person through specific characteristics in the make up of the teeth and can be used to identify the remains of a person, even when entirely distorted from fire and water damage to body.

3. Bones

   When skeletal remains are found, a Forensic scientist needs to establish from the beginning if the bones are human. If so, different bones can identify things such as sex, race, and age. Leg or arm bones can determine stature and weight. Also, any pathology of the skeleton must be start in order to make an identification of the

remains, determine the cause of death and, if homicide is involved, could even identify the murderer

4. Skull

   Computer graphics are used to perform a facial reconstruction to estimate the dead person's appearance. Like other bones, scientists can determine a person's sex and race from skull features. The difference is , with the aid of these graphics, they can also discover much about the soft tissue in the ears and nose and how much fat the person had on his or her face. The image is then usually distributed for identification.

5. Hair

   Results from hair analysis can be a bit contentious . Multiple factors can have an effect on the results, including the area on the body from where the hair was taken, the color, and the person's age and race. Standards vary as to methods of washing, cutting, and collecting hair. External substances such as air pollution, composition of the water used to wash hair, and materials used to treat hair such as shampoo, hairspray, and hair dyes may also help with the identification process.

6. Joints & Soft Tissue

   Almost 100 percent of the time, if you have something surgically implanted in you by a surgeon, then it will have a documented serial number on record. For medical examiners, these small codes can close cases and give some comfort to the family of the identified. Originally intended to speed recall of defective devices and ensure patient safety, serial numbers on implants and prosthetics are now being used to hurry the identification of John or Jane Does.

7. Skin

   Body marks can be characteristic of an individual and can be used to support an identification, in conjunction with medical or police records and/or identification given by family members. A scar can come from surgery, an accident, or assault. Scars such as severe acne during youth can leave scars that remain into adult life and may be a helpful identification tool. A number of individuals have scars from common operations like appendix removal. The dates of such operations should be in the person's medical records and the medical examiner will try to relate this to the age of the scar. If a body is partially or severely decomposed, these marks and their importance may be more of an obstacle.

8. Feet

The foot is an anatomical area that can show a wide range of individuality. There are currently two main forms used for identification on being from records kept by podiatrist while examining and treating and the other being by marks left by objects they have come in contact with the foot like shoes and ground surfaces. Toe nails can be a way to find DNA also.

GOOD LUCK