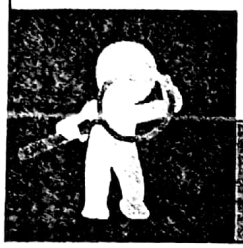
25 Batch original

Human identification



Dr Nirmala Perera
2018

Learning objectives

- 1. To learn the methods of establishing identity of dead or living for forensic purposes
- 2. To learn how to assist law enforcement authorities to establish the identity of dead or living

Instances where the identification is necessary

In a living person

In a dead person

Instances where the identification is necessary- Living

- Cases of coma, amnesia, unconscious, imposter
- Relevant to the rights of the individual person (to obtain national identity card, passport, birth certificate)
- Infants in mass disasters

Instances where the identification is necessary- Living

- Relevant to the crime and identification of criminals
- Relevant to the specific age groups referred in penal code (criminal responsibility, age of consent, rape)
- Disputed paternity

Instances where the identification is necessary – Dead

- Statistical and legal purposes (registration of death)
- Disposal of dead (for burial or cremation)
- To establish ownership of the body

Instances where the identification is necessary –Dead

- Economical and property related reasons (insurance claims, pension claims, savings, transfer of property)
- Facilitate police investigations to solve crimes (Identification of victim is needed to identify assailant)

Identification is established with

- General identification features
- Specific identification features

General identification features

- Height, weight, built of the person, complexion, appearance

Specific identification

- Facial features
- Clothes and ornaments
- Scars, marks, tattoos, occupational stigmata
- Facial reconstruction
- Photo superimposition
- Finger prints
- Dental identification
- DNA

Interpol criteria of Identification Minor criteria

Personal description

Medical findings

Evidence and clothing found on the body

Interpol criteria of Identification – Major criteria

Fingerprint analysis

Comparative dental analysis

DNA analysis

Identification of the person in a case of death

- Scene visit
- Collect all the personal belongings of the person with the body in a body bag

Autopsy

- Take good photographs of the facial features and special features on the body and preserve them during autopsy.
- Body is refrigerated and allow to identify at least for 2 weeks.

Action taken by the police

- In a case of unknown body police will publish general features of the person in newspapers.

Action taken by the police

- Finger prints are obtained by the police for possible matching.
- Bring the post mortem order and body is disposed with government expenses if there are no relatives.

Autopsy of a unknown body

Take History from

Eye witnesses

Police

Those who claim the body

History

History related to the incident

History related to the identification

Preliminary investigation

If necessary take pre autopsy x'rays

Examination of body

External examination and internal examination will help to establish the identity.

Examination of clothing

Type of clothing

Size of clothing

General description

Age

Gender

Weight

Built

Possible ethnicity

Determination of stature

Head - heal measurement

Determination of sex

Presumption of sex

Clothing

body contour

distribution of hair

external genitalia

Determination of sex

Confirmation of sex

Internal organs -presence of uterus, ovary, prostate

Nuclear sex

Skeletal features - Morphological features of skull, pelvis or long bones

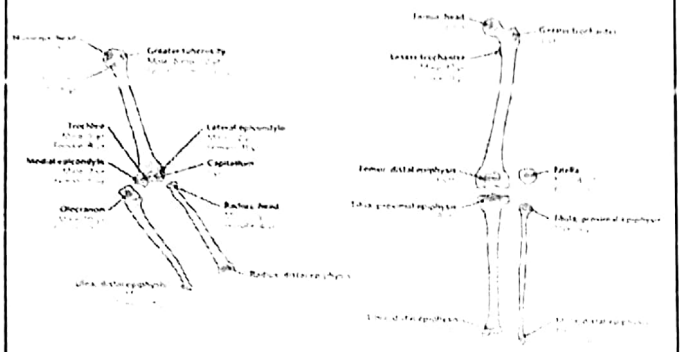
Estimation of age

Estimation criteria of age
in living and dead

Foetus	Ossific centers, crown heal length, crown rump length, weight Head circumference, limb buds, appearance of nails, hair
0-10 days	Cord changes
10 days -6 months	Length and weight, foetal Hb
6 months 2 years	Primary dentition, anterior frontanelle, ossific centres
2 years-24 years	Growth chart, secondary dentition, calcification of roots, epiphyseal unions, pubertal changes
After 25 years	It is very difficult, balding ,graying of head hair, facial hair, pubic hair
Old age	Arcus senilis, osteo-arthritic changes, skin elasticity

Osific centers

Time of appearance of secondary ossification centres

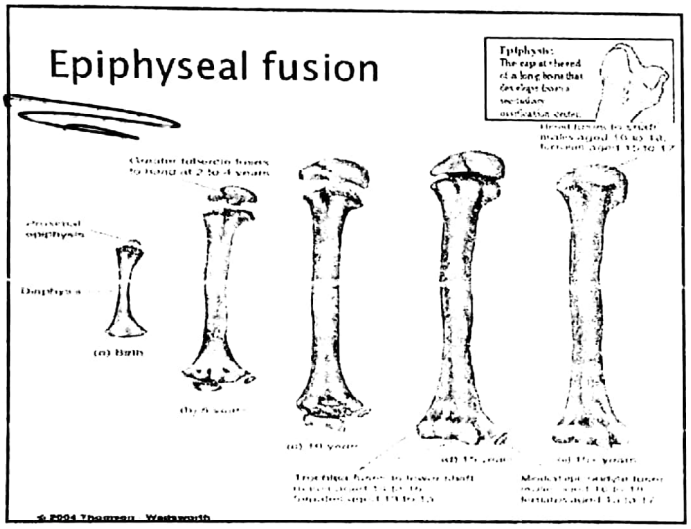


Cranial Sutures

Fontanels

- **Anterior Fontanel** – Largest Fontanel closes 18 – 24 months after birth
- **Posterior Fontanel** – Closes 2 months after birth
- **Anterolateral Fontanel** – Closes 3 months after birth
- **Posterolateral Fontanel** – begins to close 1 2 months after birth and finishes closure at 12 months

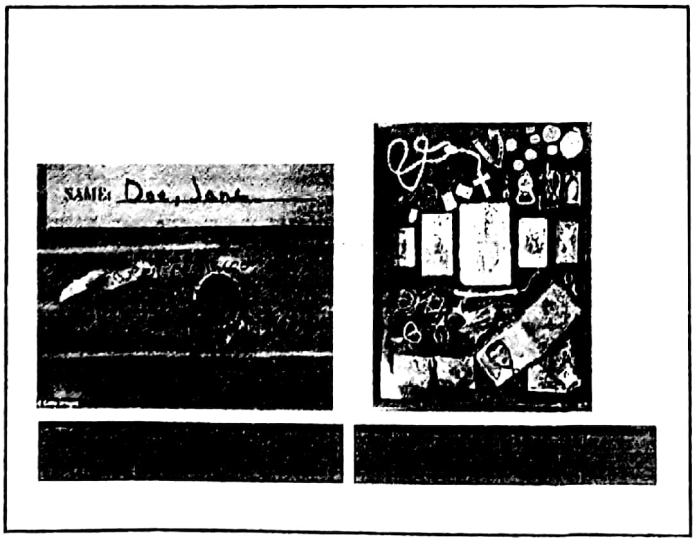
Epiphyseal fusion



External examination

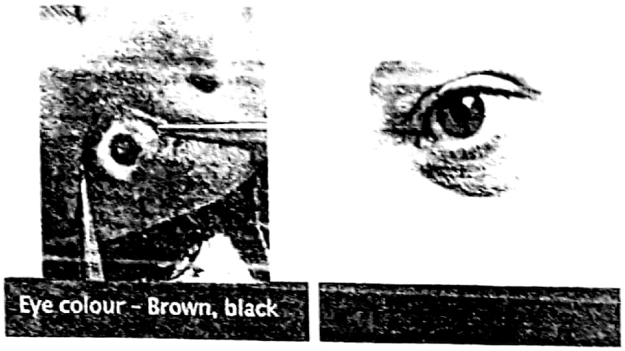
Describe ornaments, personal belongings

Jewelry, valets, personal identification documents such as ID cards, credit cards



Record features of facial recognition

Hair – strait or curly,gray, black



Eye colour - Brown, black

Appearance of cheek bones, chin, forehead, mustache

Record features of facial recognition

Special features on the face (scars -cleft lip, birth marks)

If there are facial injuries, reconstruction of face is important

Identification by facial features is difficult not only due to post mortem changes but at severe decomposition, burns and other injuries

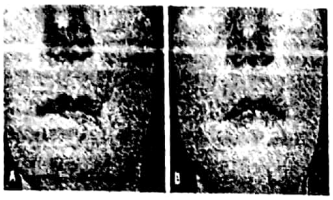
Identification using external bodily features

Stigmata of occupation - paints, saw dust, callosities in manual workers, puncture marks on fingers in tailors

Congenital anomalies - additional fingers, cleft palate, kyphosis

Scars- natural disease, trauma, surgical procedures

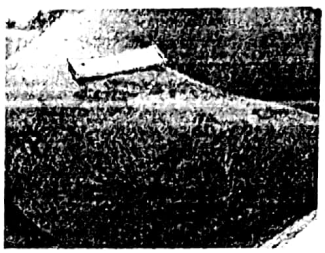
Marks- birth marks, warts

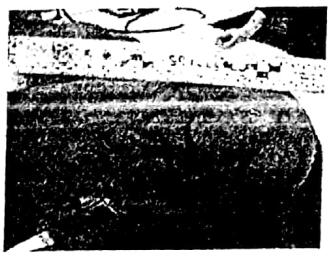


Facial scars

Laparotomy scars

Tattoo marks – preserved in decomposition since dye is injected into the dermis

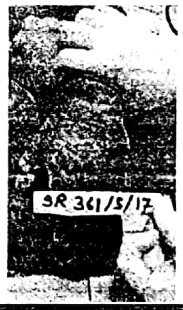




Identification using external bodily features

Acquired deformities – fractures, loss of fingers

Stigmata of natural disease – Finger clubbing, goiters, lumps, rash



Internal findings

Evidence of natural disease – carcinoma

Surgical procedures – removal of internal organs

Evidence of previous trauma – presence of pellets, bullets, healed fractures

Insertion of medical devices – Unique numbers found on heart pace-makers and prosthetic devices, plates and pins

Recode these findings with photographs

Establishing Identity following autopsy

If there is a party who claims the body collect information on identification from them and compare those with the records.

If the body is in the mortuary relatives are allow to view the body under good light to recognize the person by external features and with preserved items such as clothing and personal belongings.

Allow them to view the photos and personal belongings if post mortem is already performed.

If relatives are in doubt or JMO is not satisfied with external identification, proceed with the investigations.

Major criteria of identification

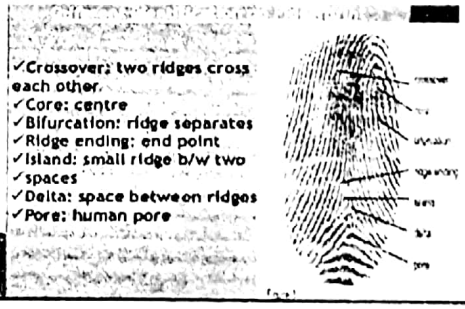
Fingerprint analysis

Comparative dental analysis

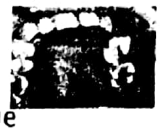
DNA analysis

Identification by finger prints (dactylography) – Major criteria

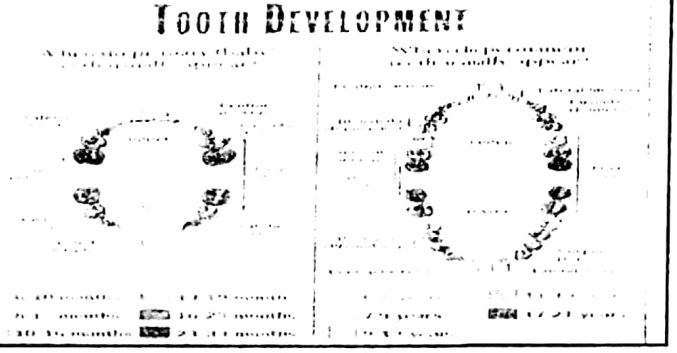
- Fingerprints are unique
- Fingerprints do not change
- Fingerprints can be classified



Identification by dental features – Major criteria



- Previous dental charts
- Eruption of teeth according to the age



DNA finger printing/profiling – Major criteria

In a DNA chain there are silent adjacent sequences which are constant for a given individual and that they are transmitted, like blood groups, from the DNA of each parent.

Paternity/maternity testing

Positive identity of the father can be established using DNA samples from the child , mother and the father.

Samples that can be used for DNA identification

Fresh blood

Buccal mucosa

Tissue samples (muscle, bone, hair, teeth)

Dried blood stains

Seminal fluid

Donner for DNA comparaison

Monozygotic / identical twins/ Siblings of the victim

Biological mother and biological father of the victim

Biological children

Establishing identification

- Review ante mortem and post mortem findings
- Narrow down identification of the person during comparison
- Establish individual identity/Rejection of identity

Establishing identity in skeletal remains

1.Are the remains actually bones?

Sometimes stones, or even pieces of wood are mistaken by the public or police for bones: the anatomical shape and texture helps in identification.

2.Are the remains human?

Appearance of long bones and large bones help in identification. It may be extremely difficult with small bones or with cremated, fragmented bones.

3. How many individuals are present?

If there are two skulls or two left femurs it is easy to identify number of individuals as 2. However, if there are no obvious duplications, it is important to examine each bone carefully to assess whether the sizes and appearances match with other bones.

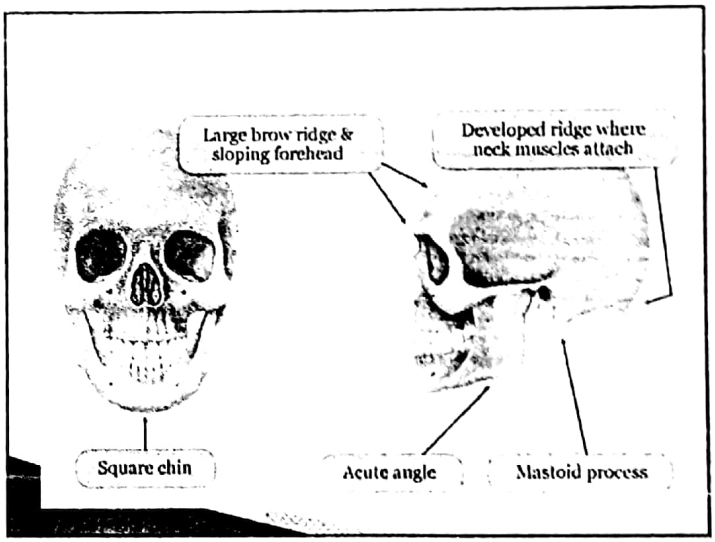
4. What sex are the bones?

The skull and the pelvis offer the best information on identifying sex, other bones provide less assistance.

Male and female skull differences

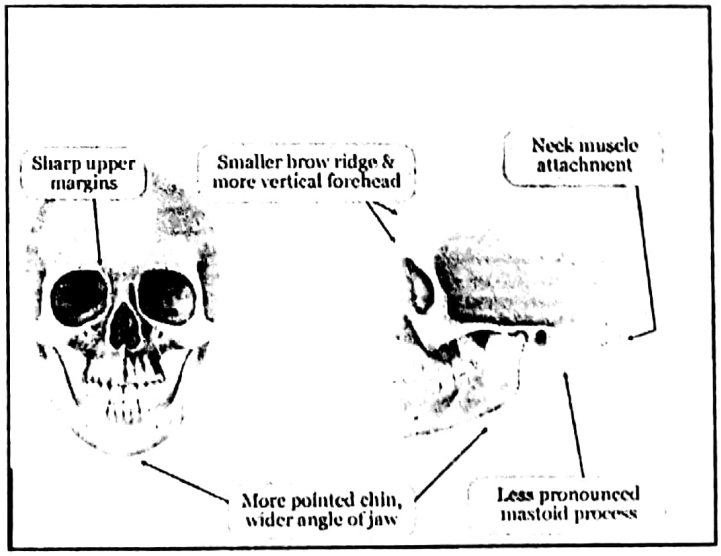
- Male Skull

- Generally larger than female
- Larger brow ridges, with sloping, less rounded (slanting) forehead
- Greater muscle attachment areas on the back of the head
- Larger mastoid processes
- Square chin with a more vertical (acute) angle of the jaw



- Female Skull

- Smoother bone surfaces where muscles attach
- Less pronounced brow ridges, with more vertical forehead
- Sharp upper margins of the eye orbits
- Smaller mastoid processes
- Chin more pointed, with a larger, obtuse angle of the jaw



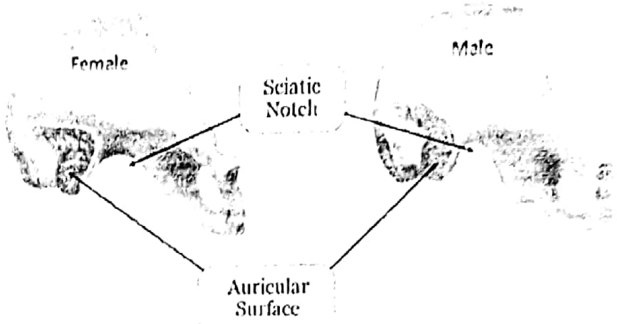
Male and female pelvis

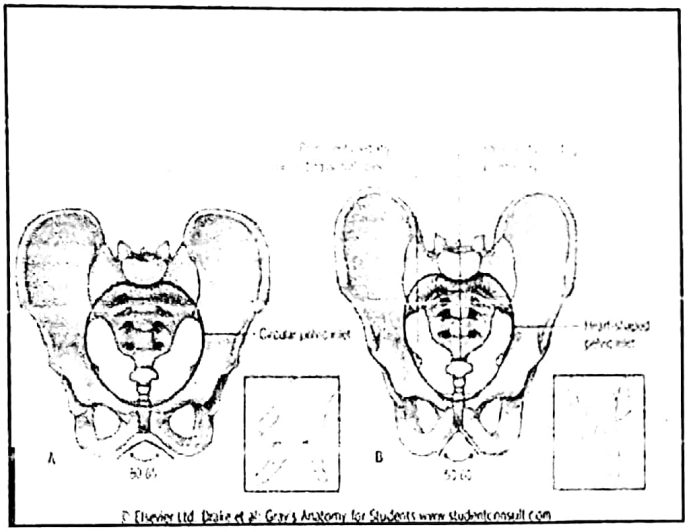
Female Pelvic Bones

- Broader sciatic notch
- Raised auricular surface
- Circular pelvic inlet
- Wider pubic angle

Male Pelvic Bones

- Narrower sciatic notch
- Flat auricular surface
- Heart shape pelvic inlet
- Smaller pubic angle





Stature

- 5. What is the height (stature) of the person?
- If whole skeleton is present approximate height is calculated.
- Otherwise using measurement of long bones height is calculated using charts.

6. Can a special identity of the individual be established?

This is difficult without proper evidence. Presence of metal prostheses , healed fractures, comparison of frontal sinus pattern in skull x'ary provide useful evidence.

Facial reconstruction from the skull

Average soft tissue thicknesses are filled on the available skull creating an facial image of the person using soft wear.

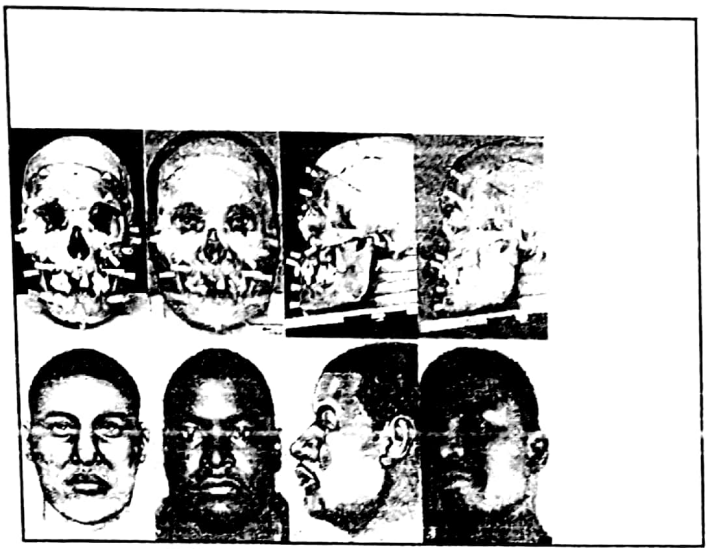
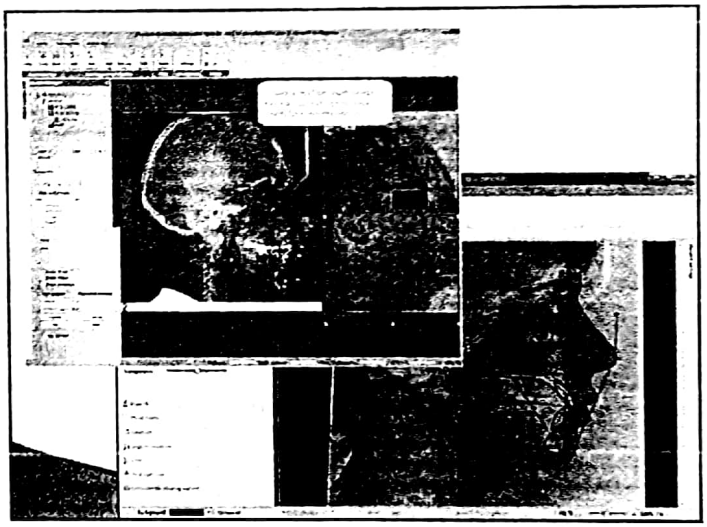


Photo superimposition

A photograph of the possible individual is overlaid with a photographic transparency of the skull, which has been scaled to size and orientated to match the angle of the head in the portrait.



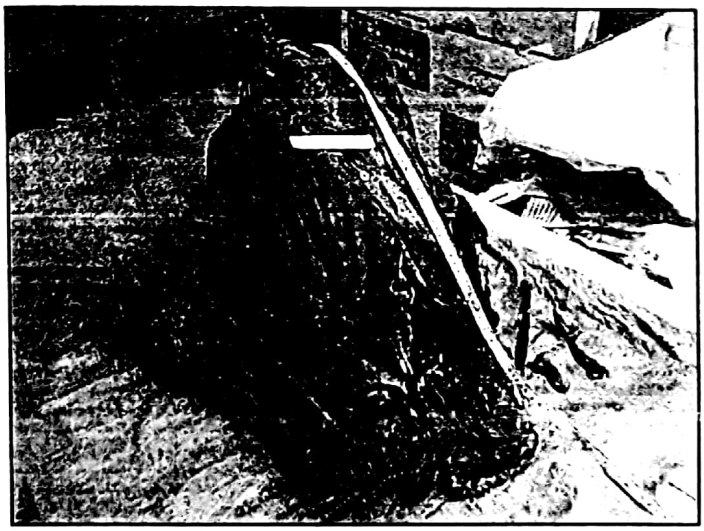
Analysis of ante mortem and postmortem data

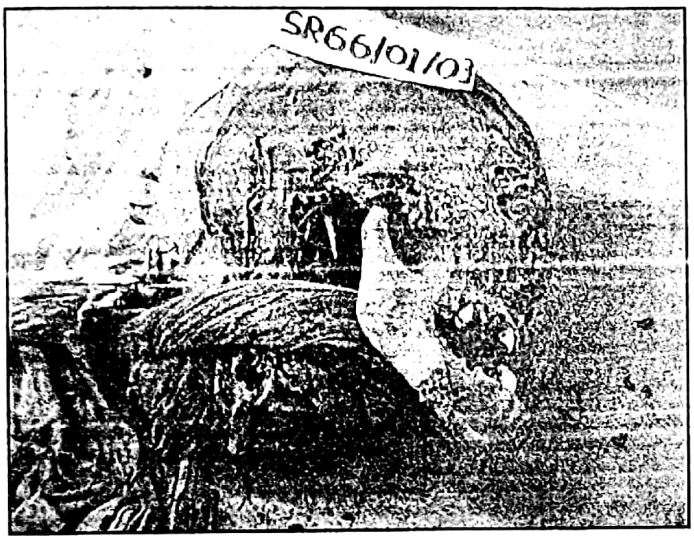
After the autopsy compare and analyze ante mortem data and post mortem data considering major and minor criteria of identification.

If identification is established body will be handed over to the relatives.

If criteria are not adequate for a positive identification, court order can be obtained for DNA analysis.

There should be children, parents or siblings of the deceased to obtain control sample for DNA comparison





Summary

- Identification of living
- Identification of dead
- Identification of skeletal remains

Thank you