

RADIOGRAPHIC ERRORS AND ARTIFACTS. Neill Serman. August. 2000.

Definition : An artifact is a structure or an appearance that is not normally present on the radiograph and is produced by artificial means.

Radiographic errors may be due to **technical errors** [errors related to the technique of taking the radiograph] or **processing errors** [related to all aspects of processing]

Artifacts may occur as a result of **improper handling** of the film packet, and accidents incidental to **processing** of the films and from defects of the film and film packet - rare. Also, excessive **movement** of the tube, the patient's head or the film may result in a variety of unusual radiographic flaws. The following is a list of some -

When radiographing the maxilla one is utilizing a **positive** angulation and for the mandible, a **negative** angulation. Foreshortening is due an increased vertical angulation and elongation is due to a reduced vertical angulation

RADIOGRAPHIC ERRORS AND ARTIFACTS ON THE FILM

Stafne & Gibilisco. Chapter 23 Manson-Hing .Chapter 3.

1. **Distorted images** - from improper alignment of the tube, object or film.
 - Vertical - elongation - vertical angulation too **small**
 - foreshortening - vertical angulation too **great**
 - Horizontal - overlapping - incorrect horizontal angulation
2. **Finger marks** - from improper handling with hands;
 - dark finger marks - developer on fingers
 - fluoride - particularly stannous
 - dirt (grease)
 - clear finger marks - fixer on fingers
3. **Blurred images** - from movement of the patient, film, or tube during exposure. The **complete film** will be blurred.
4. With a **bent film** **part** of the film will be in focus [usually the crowns] and part will be blurred. [elongated]
 - 4.1. When the film is completely bent over the lead foil from the back of the film appears on the front of the film and causes whites lines area areas, usually in the corner of the film closest to the roots.
5. **Dark or light** films where images are visible - error in any one of the factors controlling density or distance. With the three exposure or three processing errors, the **whole film** will be affected.

6. Completely clear film -
 - i) machine not switched on
 - ii) malfunction of machine
 - iii) placing film in fixer before developer solution
 - iv) film not taken / exposed
7. Cone cutting - beam of radiation did not cover film - improper alignment [vertical or horizontal] / OR - long axis of rectangular cone placed horizontal for anterior film or vice versa, OR improper set-up of aligning instruments.
8. Herring bone pattern / **Tire Track** - film placed wrong way round in mouth. Film will have reduced density and marks / pattern on one side of film. Without the marks - see # 5 above.
9. Double exposure - same film is exposed twice. Often this results in another film not being exposed, thus another film will appear clear. The images may appear **superimposed**, [parallel] at **ninety degree angles** to each other or **upside-down**. [180°]
10. Static electricity - films forcibly unwrapped or excessive flexing of film. Seen more often in dry, hot environment. Black "**lightning**" marks
11. Crescent shaped **black** lines -
 - i) fingernail pressure on the film
 - ii) excessive bending the film.

Crescent shaped **white** lines - cracked intensifying screen
12. Reticulation - the emulsion contracts with time when subjected to great changes [difference of at least 15 degrees]in temperature between the different processing solutions
13. Undeveloped / clear area on film
 - i) Incomplete immersion of film in developer - linear gray levels along edge - common board question.
 - ii) Films overlapping during processing - outline of film.
 - iii) Fixer on operators hands - clear finger prints
 - iv) Cone cutting sharply delineated round or straight area
 - v) Film not exposed
14. Scratched film - Emulsion is soft during processing. Long fingernails, careless handling during manual processing, wet films touching other films while being processed or drying.
15. Black borders - i. Wet or leaking packets allow light to enter a poorly sealed edge of film packet. Dry films on removal from mouth.

- ii. light due to opening day light loader too soon
- 16. Black spots - dirt in the duplicating machine
(developer drops will be dark)
- 17. Streaks -
 - i. Improper washing of film hanger
 - ii Dirty rollers.
 - iii heating pad in automatic processor not functioning
- 18. Radiolucent spots -
 - i) developer drops [dark]
 - ii) powder from the gloves
 - iii) developer chemicals not properly dissolved
- 19. Clear spots -
 - i) Air bubbles sticking to film during processing
 - ii) Fixer splashed on film prior to developing
 - iii) Dirt in the intensifying screens
- 20. Brown film. With time the film will go brown if not left in fixer solution or water bath [final wash] for the required amount of time with manual processing. Also with exhausted fixer solution with automatic processing. When the radiograph is initially processed it will appear "normal"
- 21. Small, round, irregular, dark dots similar to static electricity - marks due to powder from gloves.
- 22. Black film - completely - exposed to light.
Black on one side of the film - hands taken out of automatic processor too soon.
- 23. Ear rings, nose rings, (metal) dentures, eye glasses etc. will all create radiographic artifacts (**double** or **ghost** images) and **must be removed** before radiographs are taken.
- 24. Gray film with loss of detail
 - film fogged
 - exhausted fixer
 - insufficient time in fixer solution.