



FACTA ANATOMICA

ARTIFACTS: PITFALLS IN HISTOLOGY

The word 'artifact' is derived from the Latin words, 'Ars' (art) & 'factum' (made). Histopathological examination of tissues still remains as gold standard for final diagnosis of various lesions. This diagnostic method requires preparation of tissue sections and staining. The procedure is laborious and starts from the time the tissues are fixed till the sections are mounted on the glass slides. The primary aim of this is to preserve the morphology of cells as close to how they were within the body before surgical removal. The various steps in slide preparation are fixation, tissue processing, embedding, microtomy, staining and mounting. Artifacts can occur at any of the above mentioned stages in slide preparations. In spite of automated tissue processors that are used for preparation of sections and staining, many artifacts are encountered which may interfere with diagnosis. Accurate diagnosis of the lesions under the microscope requires high quality sections. This depends on the skills and experience of laboratory technicians.

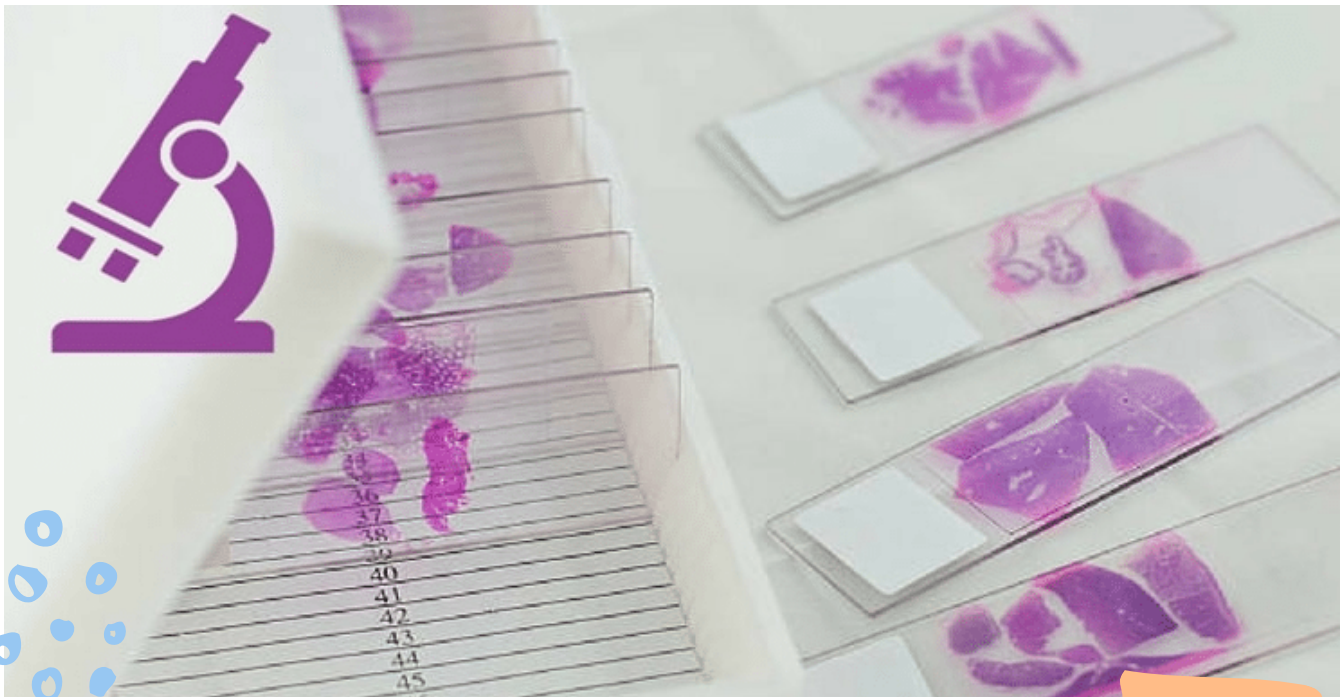
It is a fact that artifact is not a fact but misinterpreted as a fact.

Artifacts in histopathology i.e. technical artifacts are introduced into tissue specimen from the time of fixation to processing, section cutting, staining and mounting. In spite of using automated tissue processor and experienced technicians, prevalence of artifacts was found to be more than 90%.



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An artifact is defined as any structure or feature in the histological section, which is not normally present in the normal tissue, and it may come from outside sources.

Some artifact are easily distinguished and some are not. Presence of artifact can lead to inaccurate diagnosis. Hence, it is important to know and understand the commonly occurring artifact, so that we can avoid misdiagnosis.

Artifacts may be produced at any stage beginning from the time of biopsy to the final stage of mounting; which can be classified as the following ;

- Prefixation***
- Fixation artifact***
- Processing artifact***
- Cutting artifact***
- Floating and mounting artifact***
- Staining artifact***
- Microscopy artifact***



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FOLDING

(Figure 1)

Tissue folding artifacts occur during lifting of tissue sections. They can be avoided by transferring sections to new water bath and adding small amount of detergent to it. Folds in sections is a common artifact in tissues containing hard component and is difficult to avoid even with greatest care(Figure 1).

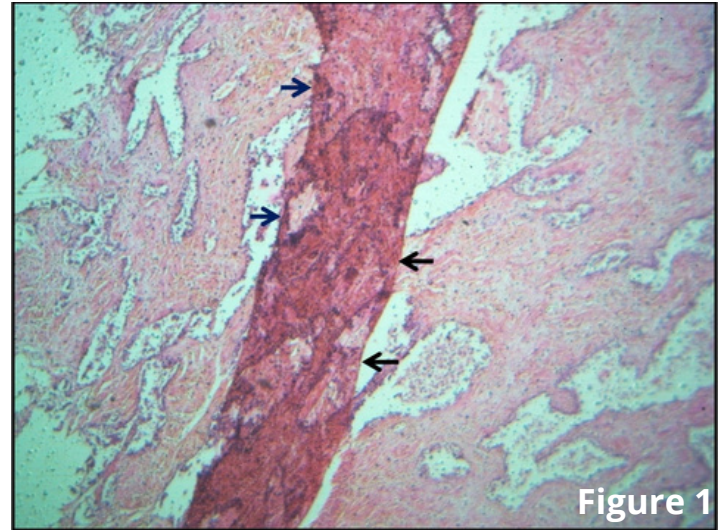


Figure 1

DUST PARTICLES

(Figure 2)

Small pieces of unrelated tissue in the slides are floaters or gross contamination artifacts. They appear either during grossing, processing or floatation of tissue sections. To avoid this artifact, only one specimen should be grossed at a time, the cutting board should be cleaned after grossing each specimen and water in the water bath has to be changed often.

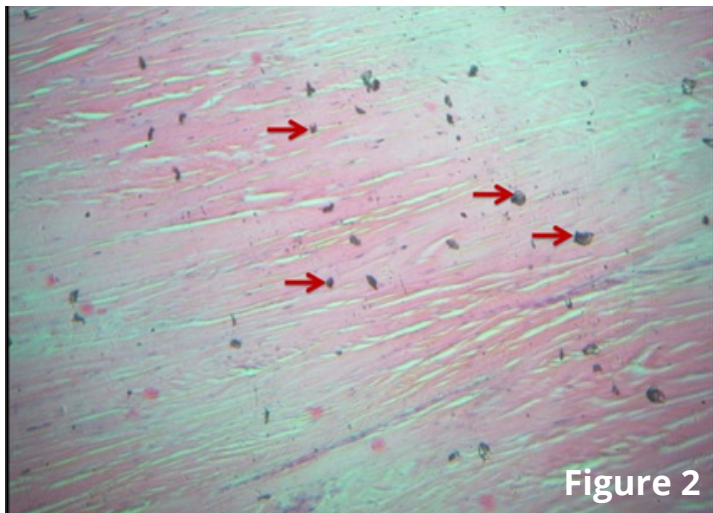


Figure 2

LINEAR TEAR

(Figure 3)

Split line in tissue section due to nick in microtome knife. Thick and thin sections appears due to loosely attached microtome blade and compression of tissue due to blunt microtome knife, vibration in knife edge, loose knife or block holder and excessive steep clearance angle.

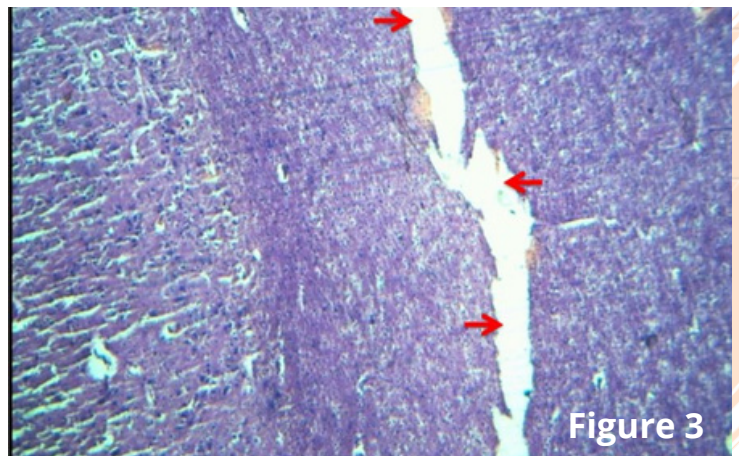


Figure 3



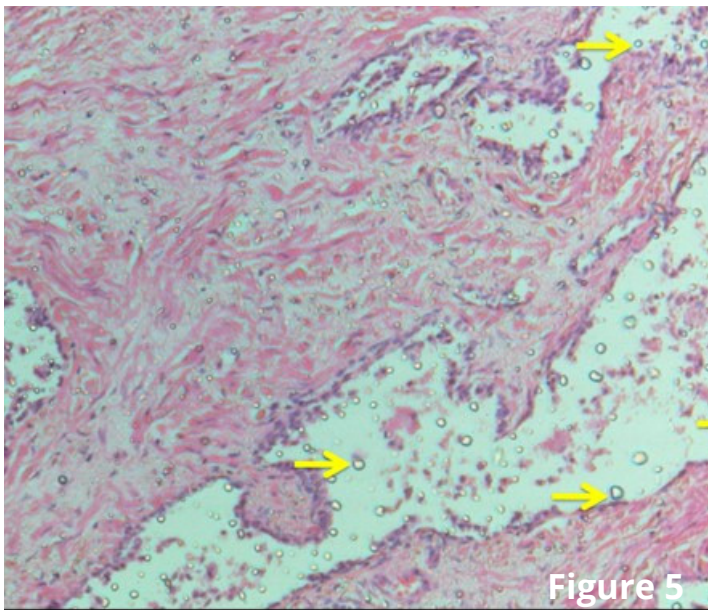
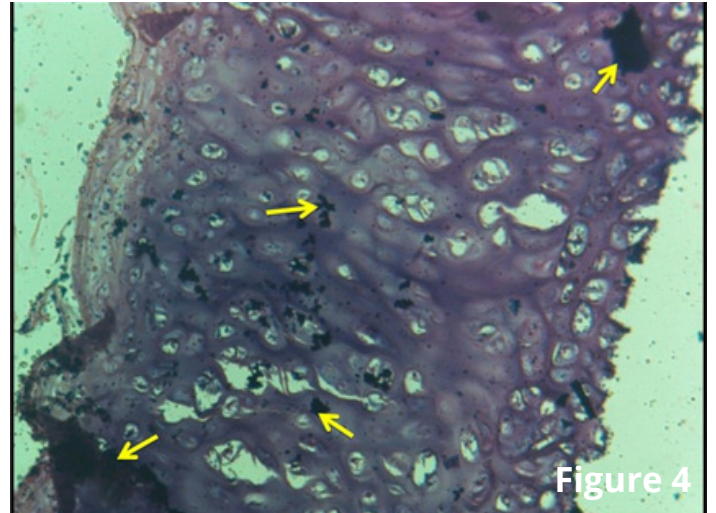
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STAIN PARTICLES

(Figure 4)

Precipitated stain lead to deposition on section.
Contamination of staining solution by microorganism, foreign particle or expired solution lead to deposition on section.



AIR BUBBLE

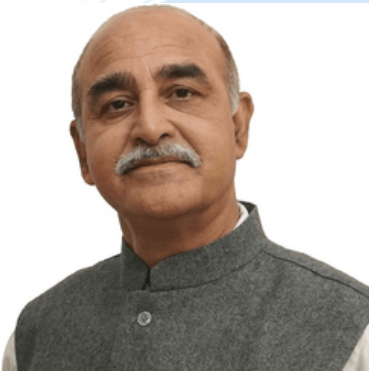
(Figure 5)

Entrapment of air bubble is due to poor floatation technique which lead to inadequate adherence of tissue to the slide. Tiny air bubbles trapped during mounting should be removed carefully by applying mild pressure using blunt needle.

CONCLUSION

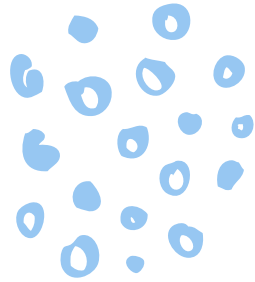
Proper technical measures need to be employed in order to prevent/minimize the occurrence of artifacts in a skilful manner, as they may pose diagnostic difficulties. Regular monitoring of tissue processing and staining is advised to minimize the occurrence of these artifacts and our laboratory has entered into an extended quality assurance program.

MESSAGE FROM EXECUTIVE DIRECTOR
PROF.DR. (COL.) CDS KATOCH, AIIMS RAJKOT



"I heartily congratulate the Department of Anatomy for bringing this informative newsletter on Artifacts in Histology. My best wishes to the entire team....."

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