

An immunohistochemical approach to detect morphine in fingernails



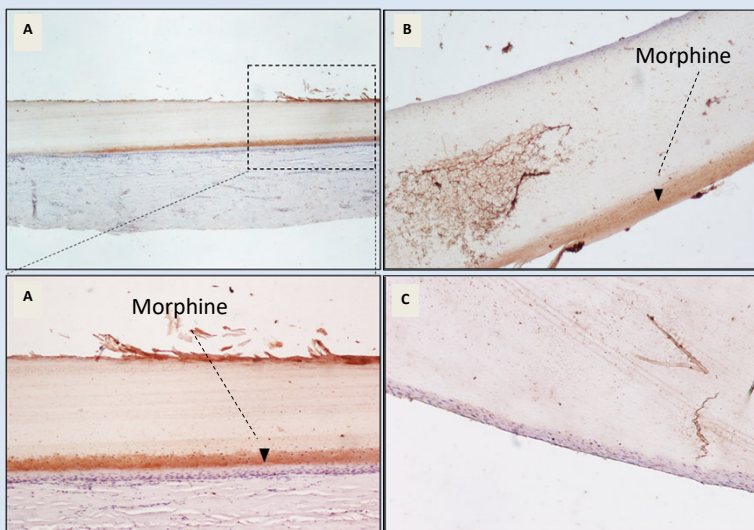
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INTRODUCTION

Immunohistochemistry (IHC) is a technique that uses antigen-antibody binding to locate the specific antigen in cells and tissue. IHC is not frequently used in forensic pathology. No study to date has applied this technique using unconventional matrices such as nails to detect drugs of abuse.

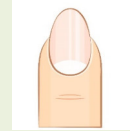
RESULTS and DISCUSSION

The semiquantitative evaluation of the immunohistochemical reaction was performed using the Nikon Eclipse E200 light microscope. The intensity of the 3,3'-diaminobenzidine (DAB) signal measured using the free software ImageJ Fiji suggested an accumulation of morphine on the cytoplasm of epithelial cells, at the level of the nail plate matrix, located at the germinal matrix section of the nail in drug-addicted subjects.



Regarding the distribution of morphine, based on our results, we can assume that the drug is less incorporated via the nail bed and that the main mechanism of distribution is deposition into the nail matrix cells, transported by the blood flow.

SAMPLES



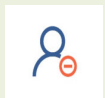
Subject A

Drug addicted



Subject B

Drug addicted



Subject C

Former drug addicted

METHODS

SAMPLE COLLECTION



PARAFFIN EMBEDDING



ANTIBODY AND PEROXIDASE MARKING



MICROSCOPE

CONCLUSIONS

The detection of a drug of abuse in the nails indicates an intake in an antecedent period, which can vary from a few weeks up to several months. Immunohistochemistry represents an innovative technique in the forensic toxicology field. This work demonstrates that this approach can be applied for forensic purposes in unconventional matrices, such as nails. It could be successfully used to establish the accumulation of substances such as morphine, and for postmortem diagnosis in autopsy specimens of alternative matrices.

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