The Mycetoma Research Center,
University of Khartoum
WHO Collaborating Center
on Mycetoma & Skin NTDs

Standard Operating Procedure for Fine Needle Aspiration and Cell Block Technique For Mycetoma Diagnosis

Number: 002/FNA/MRC/2022
On June 7, 2022.

Standard Operating Procedure for Fine Needle Aspiration and Cell Block Technique for Mycetoma Diagnosis

Introduction

This Standard Operating Procedure (SOP) outlines the steps for performing fine needle aspiration (FNA) and cell block technique for the diagnosis of mycetoma. Mycetoma is a chronic granulomatous infection that requires cytopathological and histopathological examinations for accurate diagnosis and treatment planning. Combining FNA with the cell block technique enhances diagnostic accuracy.

Purpose

- To provide a consistent, safe, and effective method for performing FNA and cell block technique of mycetoma lesions.

Scope

- This SOP applies to all healthcare professionals involved in the FNA and cell block technique for patients with suspected or confirmed mycetoma lesions.

Responsibilities
Clinician/ Pathologist

- Performs the FNA procedure.

Cytotechnologist/Pathologist

- Processes and analyses the aspirated sample and cell blocks.

Nurse/Assistant

- Prepares the patient and assists the pathologist/clinician during the procedure.

Infection Control Officer

- Ensures adherence to infection control protocols.

Equipment and Materials

- Fine needles (2225- gauge)
- Syringes (1020- mL)
- Sterile gloves, gown, mask, and eye protection
- Antiseptic solution (e.g., chlorhexidine or povidone-iodine)
- terile drapes
- Glass slides and slide holders
- Fixative solution (e.g., 95% ethanol) or spray fixative
- Specimen containers (for cell block preparation)
- Formalin for cell block fixation
- Labels and requisition forms
- Sterile dressing materials

Procedure
Pre-Procedure Preparation

Patient Identification and Consent

- Verify patient identity using at least two identifiers (e.g., name and date of birth).
- Explain the procedure, including risks and benefits, to the patient and obtain informed consent.

Patient Preparation

- Position the patient comfortably to allow easy access to the lesion.
- Expose the area to be aspirated and cover surrounding areas with sterile drapes.

Site Preparation

- Clean the skin over the aspiration site with an antiseptic solution.
- Allow the antiseptic to dry before proceeding.

Anesthesia

Local Anesthesia

Administer local anaesthesia to the aspiration site using a small-gauge needle if required for patient comfort, especially for children.

Aspiration Procedure

Needle Insertion

- Attach the fine needle to a syringe.
- Insert the needle into the lesion at the determined site.

Aspirate Sample

- Apply negative pressure by pulling back on the syringe plunger while moving the needle back and forth within the lesion to aspirate cellular material.
- Release the plunger before withdrawing the needle to prevent aspirated material from contaminating the needle track.

Sample Handling

- Remove the needle from the syringe and expel a portion of the aspirated material onto glass slides for immediate cytological examination.
- Spread the material thinly and evenly across the slide using another slide if necessary.
- Immediately fix the slides using a fixative solution or spray, commonly 95% ethanol.

Cell Block Preparation
Collect Remaining Aspirate

- Transfer the remaining aspirate material from the syringe into a specimen container with an appropriate medium (e.g., saline or balanced salt solution).

Processing the Specimen

- Send the specimen container to the cytopathology laboratory for cell block preparation.
- In the laboratory, the specimen is centrifuged to concentrate the cellular material.
- Embed the pellet in paraffin to create a cell block.

Fixation

- Fix the cell block in formalin for further histopathological processing.

Post-Aspiration Handling
Specimen Handling

- Label each slide and specimen container with patient details, date, and site of aspiration.
- Complete the requisition form, including clinical history and suspected diagnosis.
- Send the slides and specimen container to the cytopathology laboratory.

Documentation

- Document the procedure in the patient's medical record, including details of the aspiration site, sample taken, and any complications.

Wound Care
Hemostasis

- Apply pressure to the aspiration site to control any bleeding.
- Clean the area with an antiseptic solution.

Dressing

- Cover the aspiration site with a sterile dressing.

Post-Procedure Care
Patient Instructions

- Provide the patient with post-procedure care instructions, including wound care and signs of infection to watch for.
- Schedule a follow-up appointment to review aspiration results and manage any complications.

Record Keeping

- Document the procedure in the patient's medical record, including details of the aspiration site, sample taken, and any complications.

Follow-Up
Aspiration and Cell Block Results

- Review the cytopathology and histopathology reports once available.
- Discuss the findings with the patient and plan further management based on the results.

Quality Control and Safety

- Ensure all aspiration instruments are sterilised and in good working condition.
- Adhere to strict aseptic techniques to prevent infection.
- Regularly review and update this SOP to incorporate new evidence and best practices.

References

- Yousif BM, Fahal AH, Shakir MY. A new technique for the diagnosis of mycetoma using fixed blocks of aspirated material. Trans R Soc Trop Med Hyg. 2010 Jan;104(1):69-. doi: 10.1016/j.trstmh.2009.06.015. Epub 2009 Aug 22. PMID: 19700179.

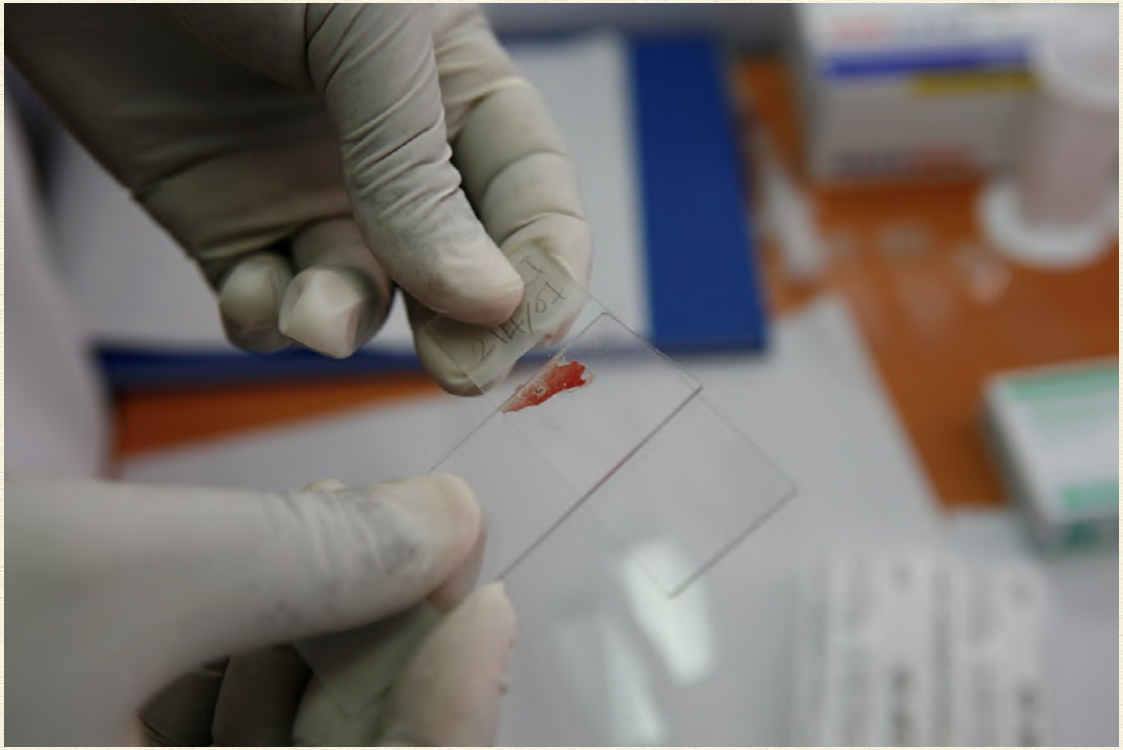
- EL Hag IA, Fahal AH, Gasim ET. Fine needle aspiration cytology of mycetoma. Acta Cytol. 1996 May-Jun;40(3):4614-. doi: 10.1159000333899/. PMID: 8669179.

- Yousif BM, Fahal AH, Shakir MY. A new technique for the diagnosis of mycetoma using fixed blocks of aspirated material. Trans R Soc Trop Med Hyg. 2010 Jan;104(1):69-. doi: 10.1016/j.trstmh.2009.06.015. Epub 2009 Aug 22. PMID: 19700179.

- Siddig EE, Mhmoud NA, Bakhiet SM, Abdallah OB, Mekki SO, El Dawi NI, Van de Sande W, Fahal AH. The Accuracy of Histopathological and Cytopathological Techniques in the Identification of the Mycetoma Causative Agents. PLoS Negl Trop Dis. 2019 Aug 29;13(8):e0007056. doi: 10.1371/journal.pntd.0007056. PMID: 31465459; PMCID: PMC6750607.

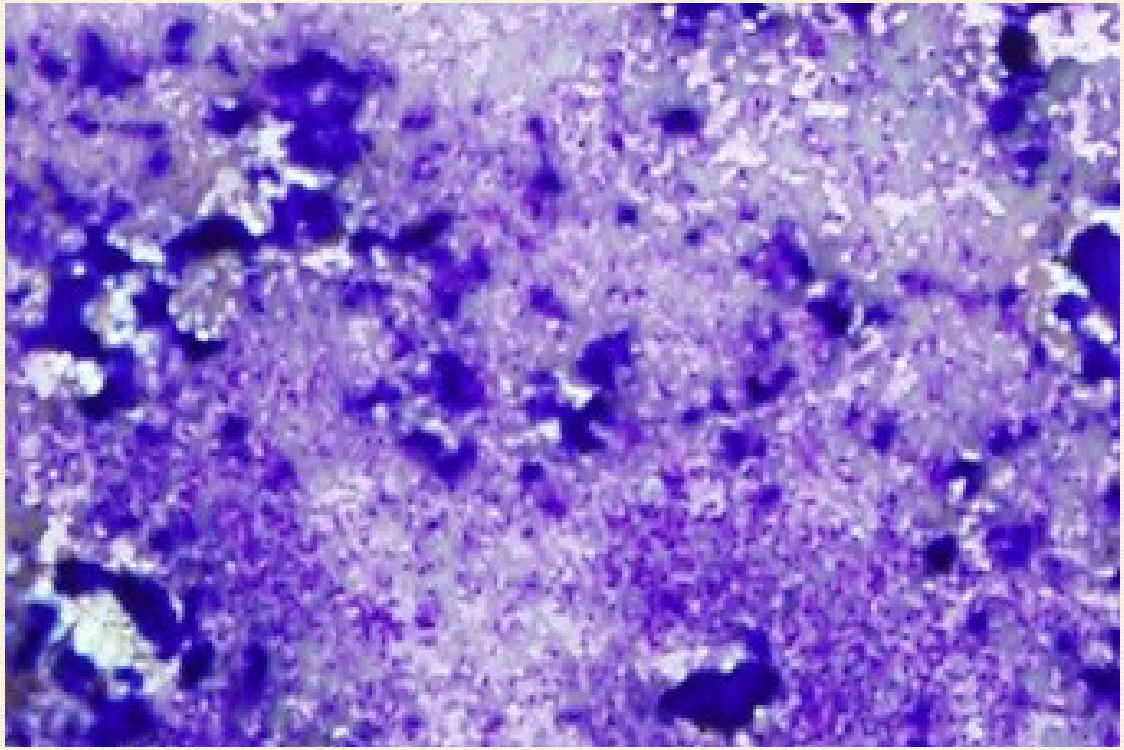
- Mycetoma Policies and Management Guidelines (https://mycetoma.edu.sd/?page_id=4362)
- Soba University Hospital SOPs for infection control.
- Manufacturer's instructions for histopathological technique.

The procedure of Fine Needle Aspiration for cytology for mycetoma diagnosis in progress



Preparing of smear for cytology diagnosis

Sample for cell block preparation



The cytological appearance of M. mycetomatis surrounding with inflammatory cells

Approval

This Standard Operating Procedure has been prepared, reviewed and approved by:

Dr Badr EL Din Margani	Pathologist	Badr EL Din Margani
Dr Imad EL Hag	Pathologist	Imad EL Hag
Prof.Lamyaa A M El Hassan	Pathologist	Lamyaa El Hassan
Prof Ahmed Fahal	Center Director	Fahal

On June 7, 2022

Number: 001/FNA/MRC/2022
On June 7, 2022.

Standard Operating Procedures for Fine Needle Aspiration Technique for Mycetoma Diagnosis

Introduction

This Standard Operating Procedure (SOP) outlines the steps for performing a fine needle aspiration (FNA) for the diagnosis of mycetoma. Mycetoma is a chronic granulomatous infection that requires cytopathological examination for accurate diagnosis and treatment planning. FNA is a minimally invasive technique that involves using a fine needle to aspirate cellular material from the lesion.

Purpose
To provide a consistent, safe, and effective method for performing FNA of mycetoma lesions.

Scope
This SOP applies to all healthcare professionals involved in the FNA of patients with suspected or confirmed mycetoma lesions.

Responsibilities
Clinician/Pathologist

Surgeon
Performs the FNA procedure.

Cytotechnologist/Pathologist
Analyses the aspirated sample.

Nurse/Assistant

Prepares the patient and assists the physician during the procedure.

Infection Control Officer

Ensures adherence to infection control protocols.

Equipment and Materials

- Fine needles (2225- gauge)
- Syringes (1020- mL)
- Sterile gloves, gown, mask, and eye protection
- Antiseptic solution (e.g., chlorhexidine or povidone-iodine)
- Sterile drapes
- Glass slides and slide holders
- Fixative solution (e.g., 95% ethanol) or spray fixative
- Labels and requisition forms
- Sterile dressing materials

Procedure

Pre-Procedure Preparation

Patient Identification and Consent

- Verify patient identity using at least two identifiers (e.g., name and date of birth).
- Explain the procedure, including risks and benefits, to the patient and obtain informed consent.

Patient Preparation

- Position the patient comfortably to allow easy access to the lesion.
- Expose the area to be aspirated and cover surrounding areas with sterile drapes.

Site Preparation

- Clean the skin over the aspiration site with an antiseptic solution.
- Allow the antiseptic to dry before proceeding.

Anaesthesia

Local Anaesthesia (if necessary)

- Administer local anaesthesia to the aspiration site using a small-gauge needle if required for patient comfort.

Aspiration Procedure

Needle Insertion

- Attach the fine needle to a syringe.
- Insert the needle into the lesion at the determined site.

Aspirate Sample

- Apply negative pressure by pulling back on the syringe plunger while moving the needle back and forth within the lesion to aspirate cellular material.
- Release the plunger before withdrawing the needle to prevent aspirated material from contaminating the needle track.
- Repeat the procedure in three different directions to increase the yield

Sample Handling

- Remove the needle from the syringe and expel the aspirated material onto glass slides.
- Spread the material thinly and evenly across the slide using another slide if necessary.
- Immediately fix the slides using a fixative solution or spray.

Post-Aspiration Handling
Specimen Handling

- Label each slide with patient details, date, and site of aspiration.
- Prepare and complete the requisition form, including clinical history and suspected diagnosis.
- Send the slides and requisition form to the cytopathology laboratory.

Documentation

- Document the procedure in the patient's medical record, including details of the aspiration site, sample taken, and any complications.

Wound Care
Haemostasis

- Apply pressure to the aspiration site to control any bleeding.
- Clean the area with an antiseptic solution.

Dressing

- Cover the aspiration site with a sterile dressing.

Post-Procedure Care

Patient Instructions

- Provide the patient with post-procedure care instructions, including wound care and signs of infection to watch for.
- Schedule a follow-up appointment to review aspiration results and manage any complications.

Record Keeping

- Document the procedure in the patient's medical record, including details of the aspiration site, sample taken, and any complications.

Follow-Up

Aspiration Results

- Review the cytopathology report once available.
- Discuss the findings with the patient and plan further management based on the results.

Quality Control and Safety

- Ensure all aspiration instruments are sterilised and in good working condition.
- Adhere to strict aseptic techniques to prevent infection.
- Regularly review and update this SOP to incorporate new evidence and best practices.

References

- EL Hag IA, Fahal AH, Gasim ET. Fine needle aspiration cytology of mycetoma. Acta Cytol. 1996 May-Jun;40(3):4614-. doi: 10.1159000333899/. PMID: 8669179.

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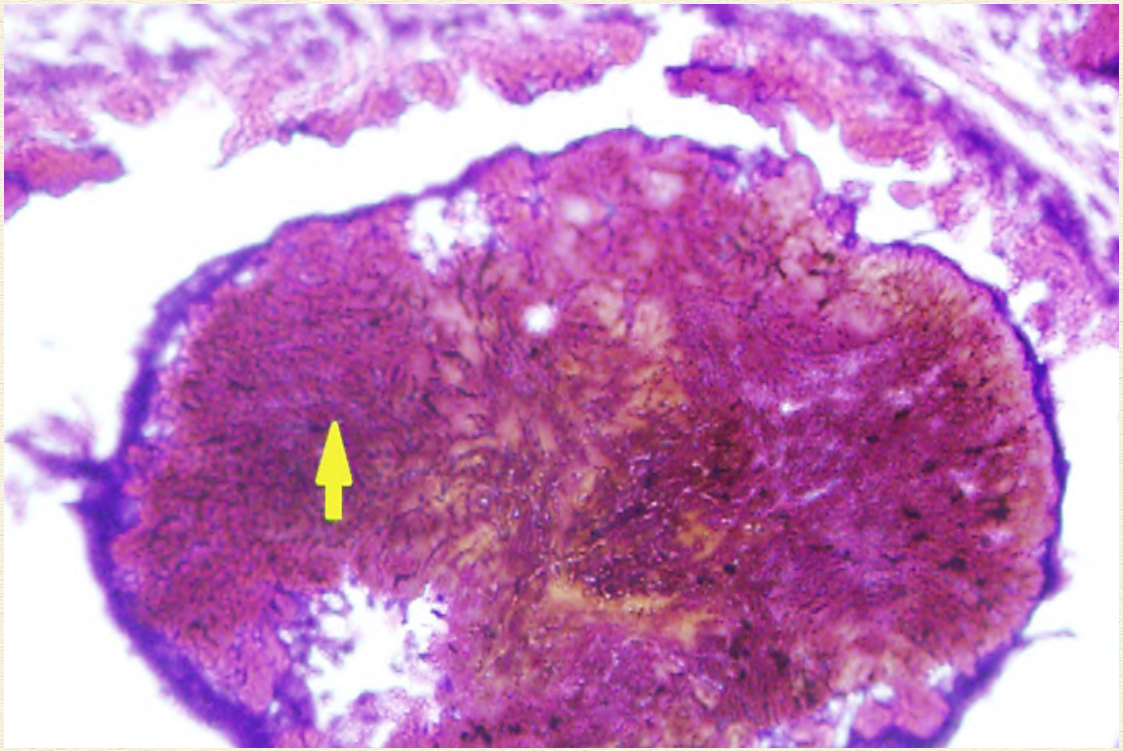
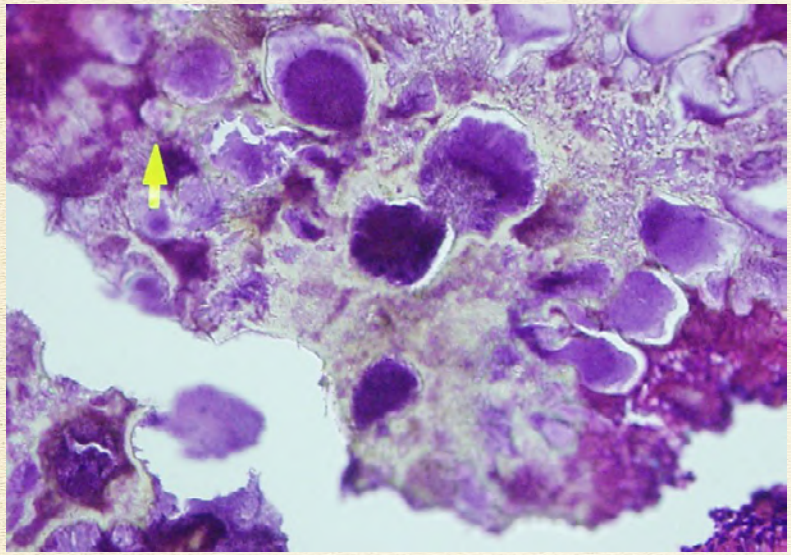
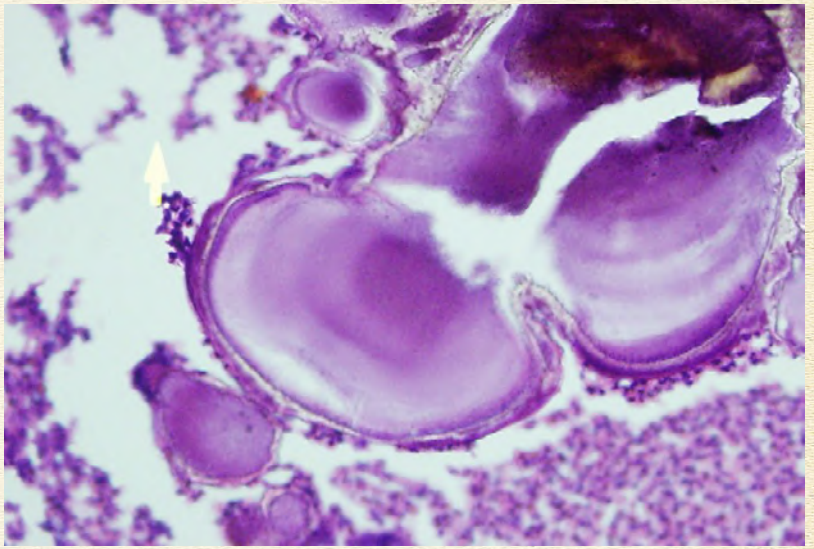
- Mycetoma Policies and Management Guidelines (https://mycetoma.edu.sd/?page_id=4362)
- Soba University Hospital SOPs for surgical procedures and infection control.
- Manufacturer's instructions for Tru-cut needle and materials.



Filamentous MM grain surrounded by inflammatory cells





Madurella Mycetoma grains are surrounded by acute inflammatory cells, mainly neutrophils. H&E stain, x40 and 20X

Approval

This Standard Operating Procedure has been prepared, reviewed and approved by:

Dr Badr EL Din Margani	Pathologist	Badr EL Din Margani
Dr Imad EL Hag	Pathologist	Imad EL Hag
Prof.Lamyaa A M El Hassan	Pathologist	Lamyaa El Hassan
Prof Ahmed Fahal	Center Director	Fahal

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