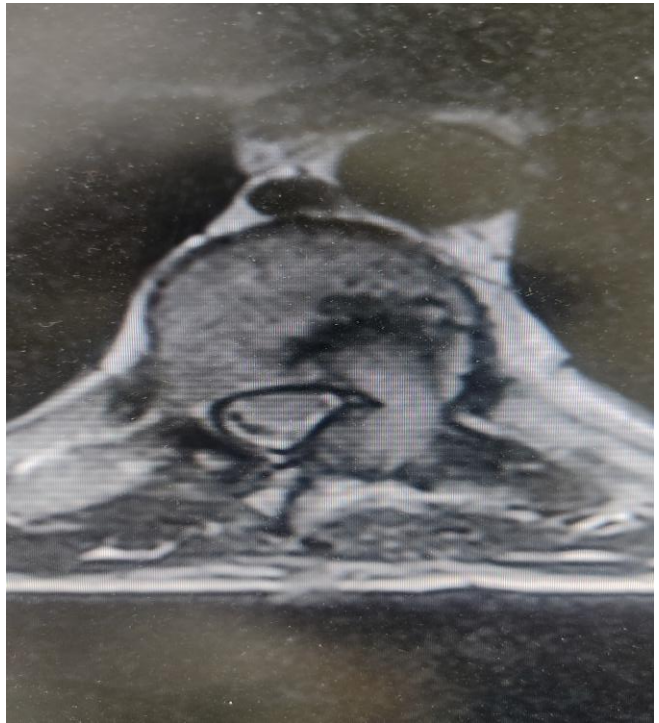
PLEASE CLICK ON THE FOLLOWING LINK TO WATCH THE LECTURE ONLINE:-

https://www.youtube.com/watch?v=ag-D0zigFqA&list=PLuBRb5B7fa_embZp8jWG_hG8_o1JXLEeo&index=2

Spine surgery learning module for RMS residents

Lecture 2

Spine infection



Presented by
Omar Bashmaf

Case 1

- A 55 y old female
- Back pain > 6 month
- Radiculopathy t5/t6

-Spondylodiscitis

infection of the intervertebral disc

Vertebral osteomyelitis

infection invades the endplates or the vertebral body.

- Spinal infections are basically divided into

a)Pyogenic

Represents 2-7% of all pyogenic

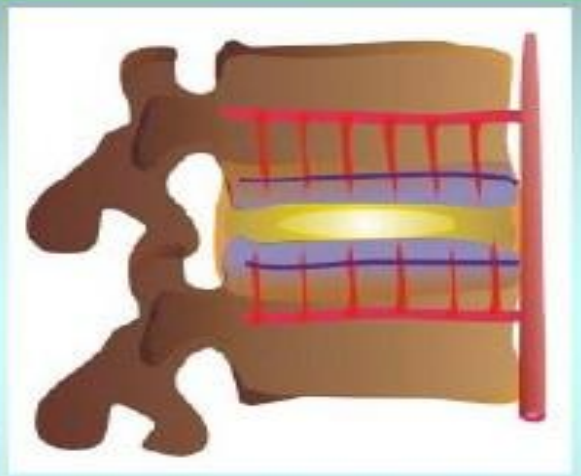
osteomyelitis

- b)Non pyogenic
- Brucella
- TB (not common at our region) Pott's disease

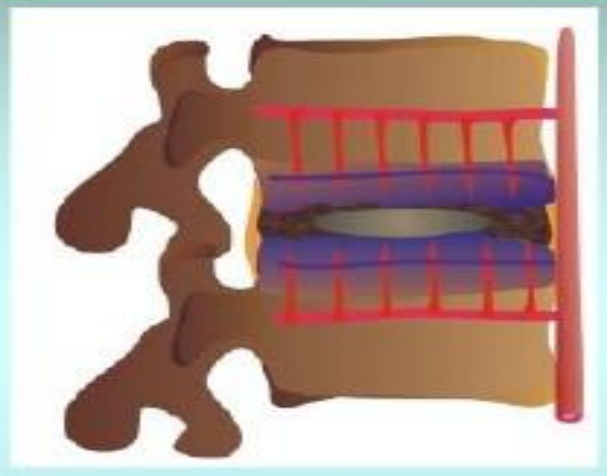
Tuberculosis spondylitis

*FUNGAL INFECTIONS

- Routes of pathogen spread
- Hematogenous
- Direct external inoculation
- Spread from contiguous tissues



1. Bacteremia invoving the metaphyseal vessels
2. Metaphyses infected



1. Since metaphyses are destroyed, the pathway to disc nutrition is impeded.
2. The pathogens infect the disc, their collagenases and proteinases destroy the disc.

1. With the endplates destroyed, the disc too degenerate and may cause pain and instability

Etiology

 Predisposing factors:

Septic focus(skin, Genitourinary tract, etc.)

Invasive procedures

Immunocompromised

Diabetes

Steroid use

Old age

Spine surgery

 Most common organism – Staph. Aureus(50%)>

Gram negative(E.coli)> Anaerobes

CLINICAL PRESENTATION

- Nonspecific local pain – first presenting feature
- Pain more during night.
- Constitutional symptoms like night sweats, anorexia, low grade fever are less common but more commonly seen in TB spine.
- Most common SIGN is Tenderness at local site.
- Sustained paraspinal muscle spasm is noted
- Abscess formation – rare presentation
- Complication: Neurological deficit - suggestive of abscess compressing over the cord

LABORATORY INVESTIGATIONS

ESR

- Elevated in 71-97% of patients
- Generally > 50mm/hr
- Elevated after surgery peak at 5 days and

elevated for 4 weeks.

- Persistent elevation after surgery suggestive of

infection

- Remains high even after treatment for prolonged

period of time

CRP

- More sensitive marker
- Peaks within 2 days of surgery and has rapid fall
- Elevation even after a week of surgery suggest of

infection

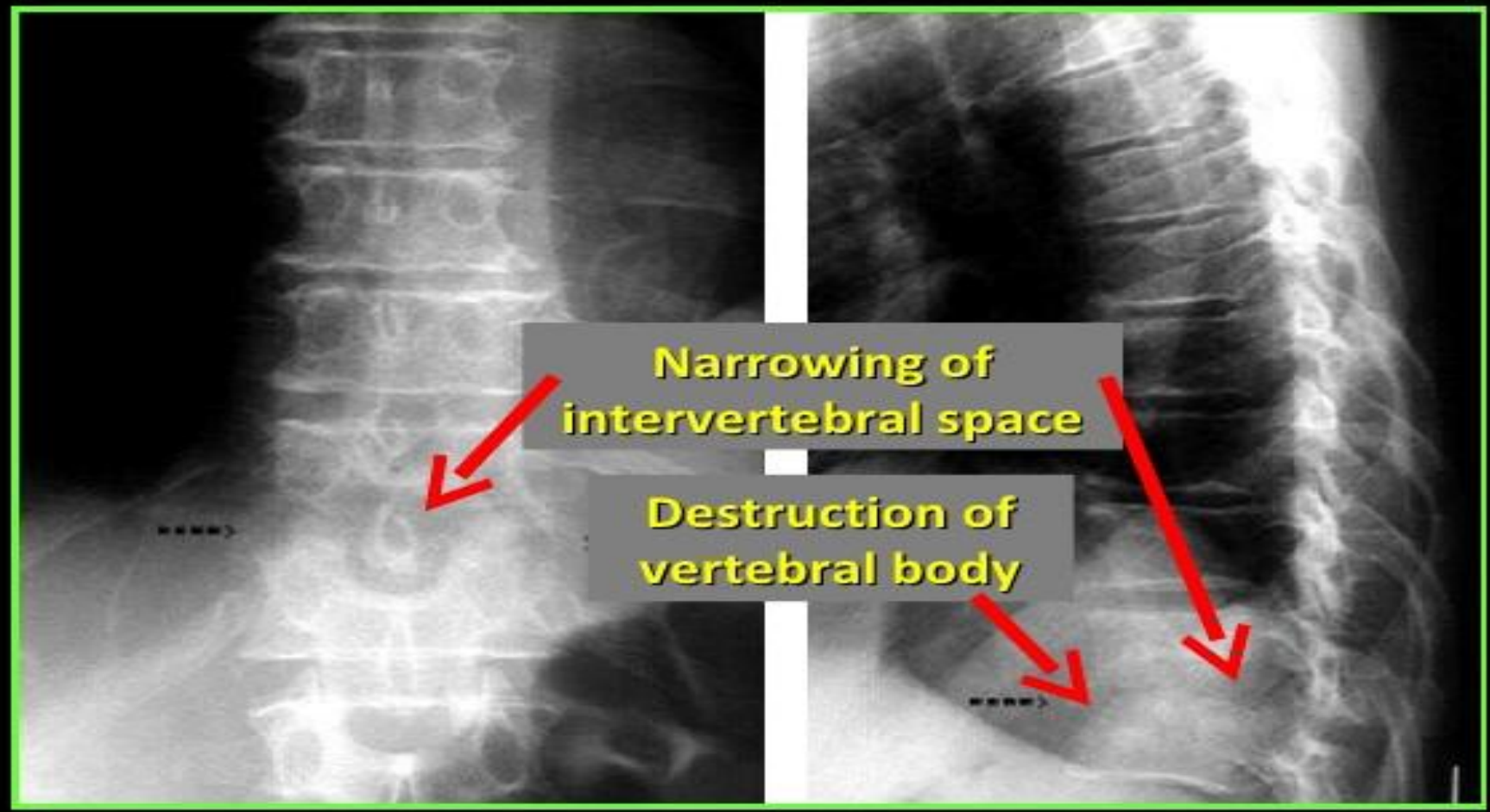
- Rapidly decline following treatment.

- Other tests: CBC: may show leucocytosis
- Blood culture- positive in around 60%

- XRAY
- □ Findings lag 2-4 weeks behind onset of symptoms
- □ May show: Narrowing of disc space
- Vertebral plate irregularity
- □ Late findings include- Destruction of vertebral body, bony
- ankylosis

- Radiological investigation:

  a) Plain x-ray:



Primary and metastatic Tumours

Infections in contiguous structures like that of psoas, abdomen, GUT.

Rheumatoid arthrirtis

Ankylosing Spondylitis

Epidural infections

CT SCAN

 Beneficial over radiograph – more sensitive to earlier changes

 Identifies soft tissue and paraspinal mass easily

 Findings- > lytic defects in subchondral bone

> Multiple holes seen in cross sectional views


KHADER ABLA
S 304
Filter

T1 IMAGES: Low density changes in bone and disc
T2 IMAGES: High density changes in bone and disc.
Abscess are areas with very high uptake.

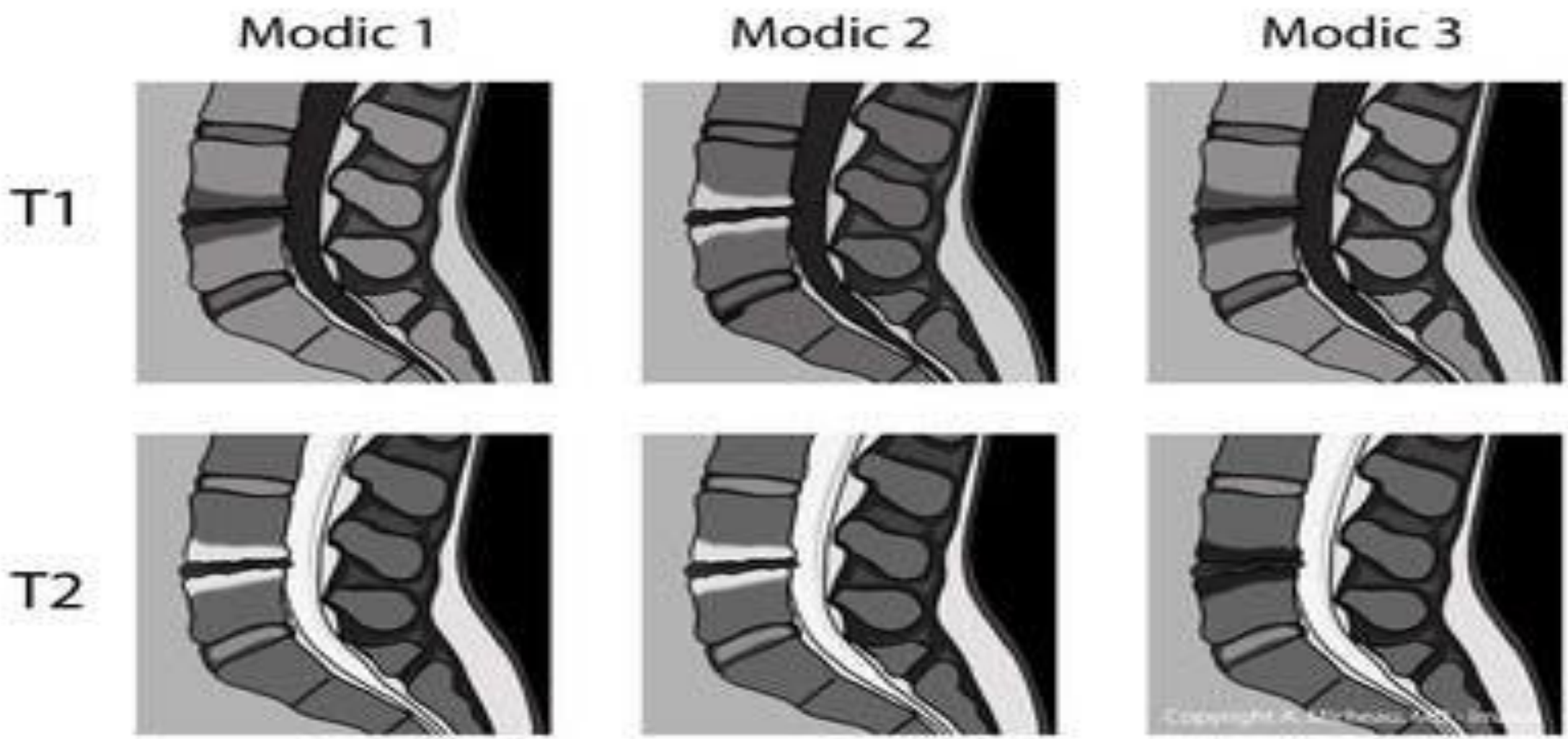
- Using serial MRI helps in showing response to treatment.
- Following treatment soft tissue findings tend to improve while the bony findings like marrow edema remains.

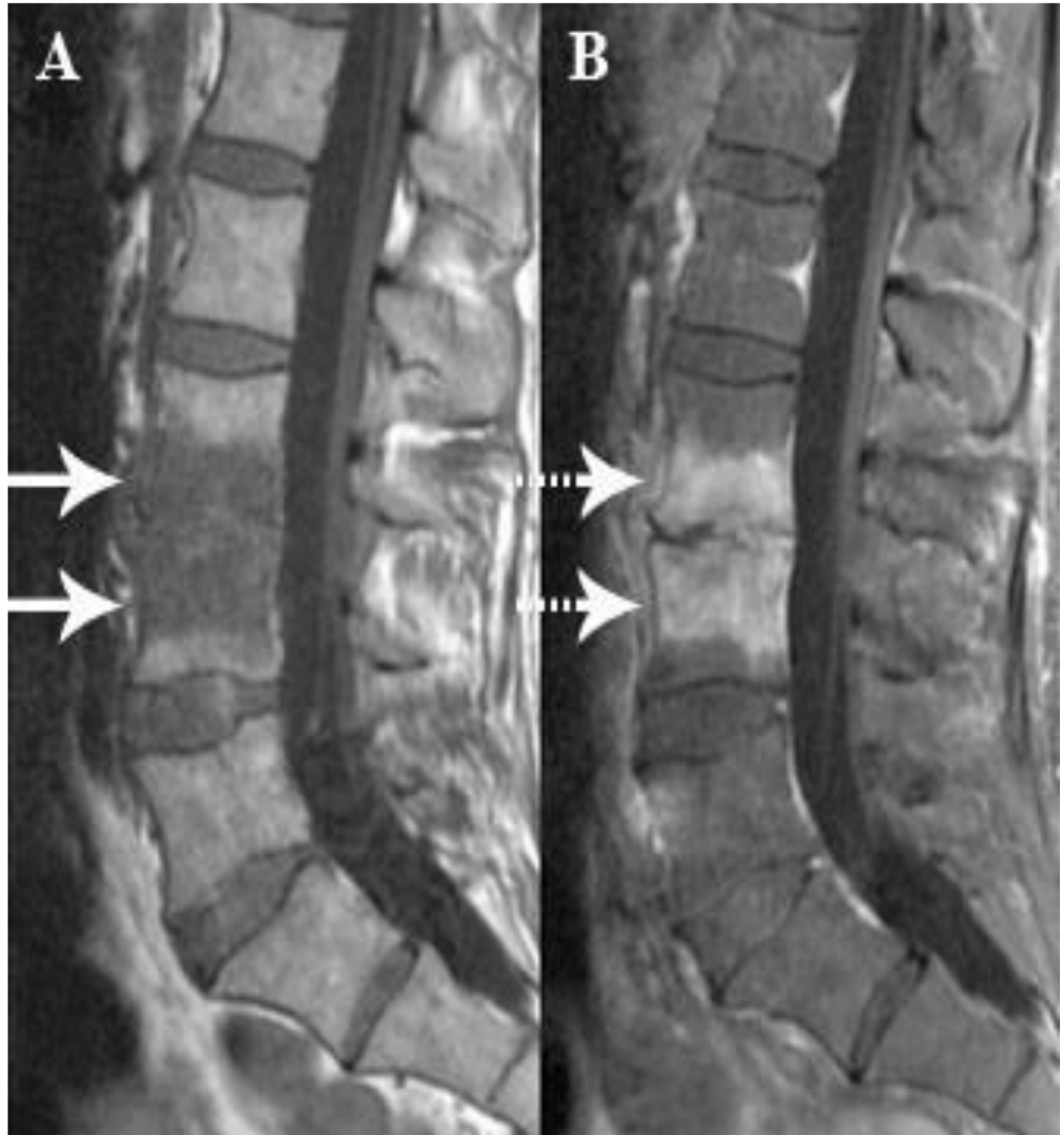
T1

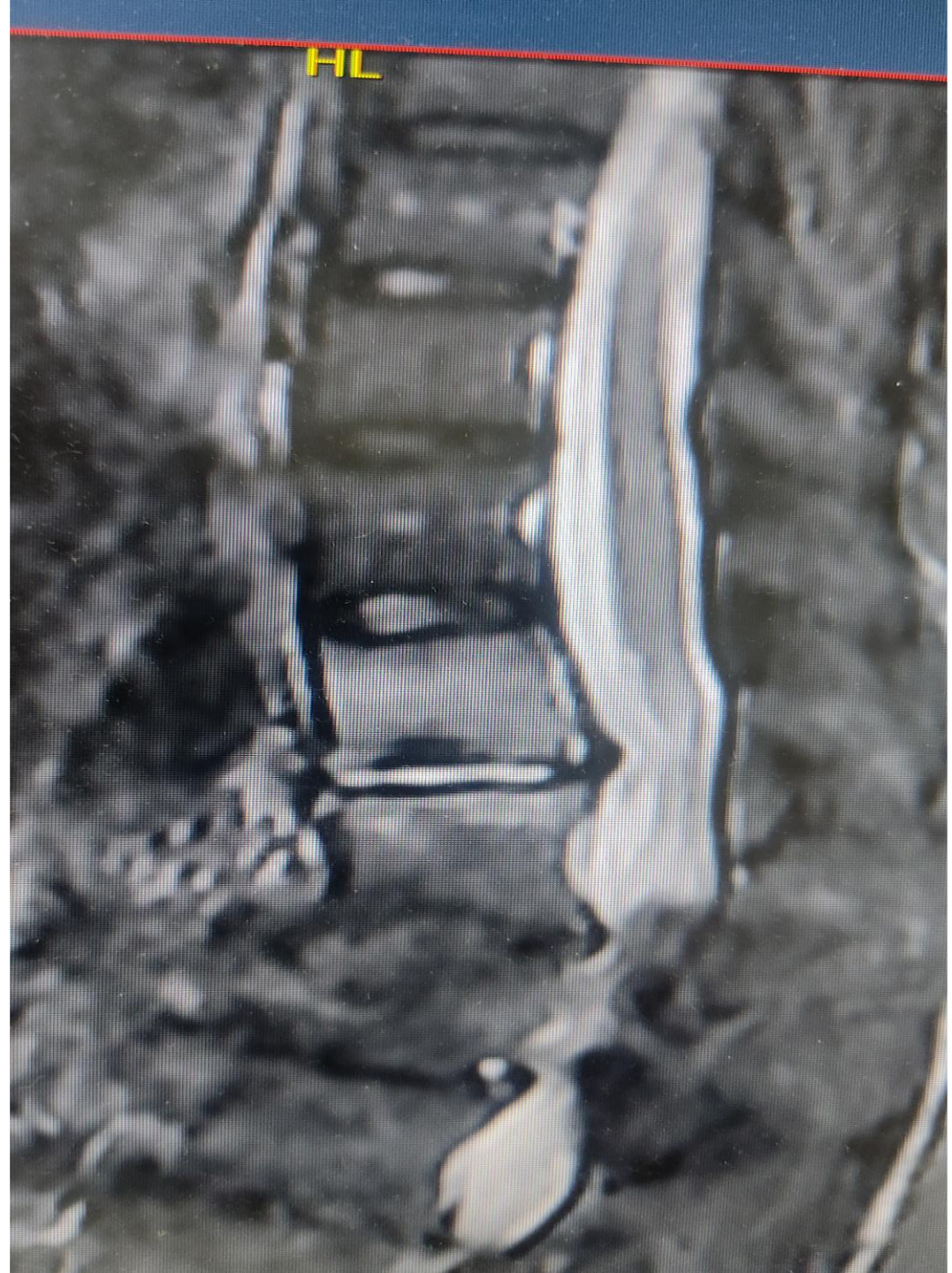
Modic changes on MR imaging, are signal intensity changes in vertebral body marrow adjacent to the endplates of degenerative discs

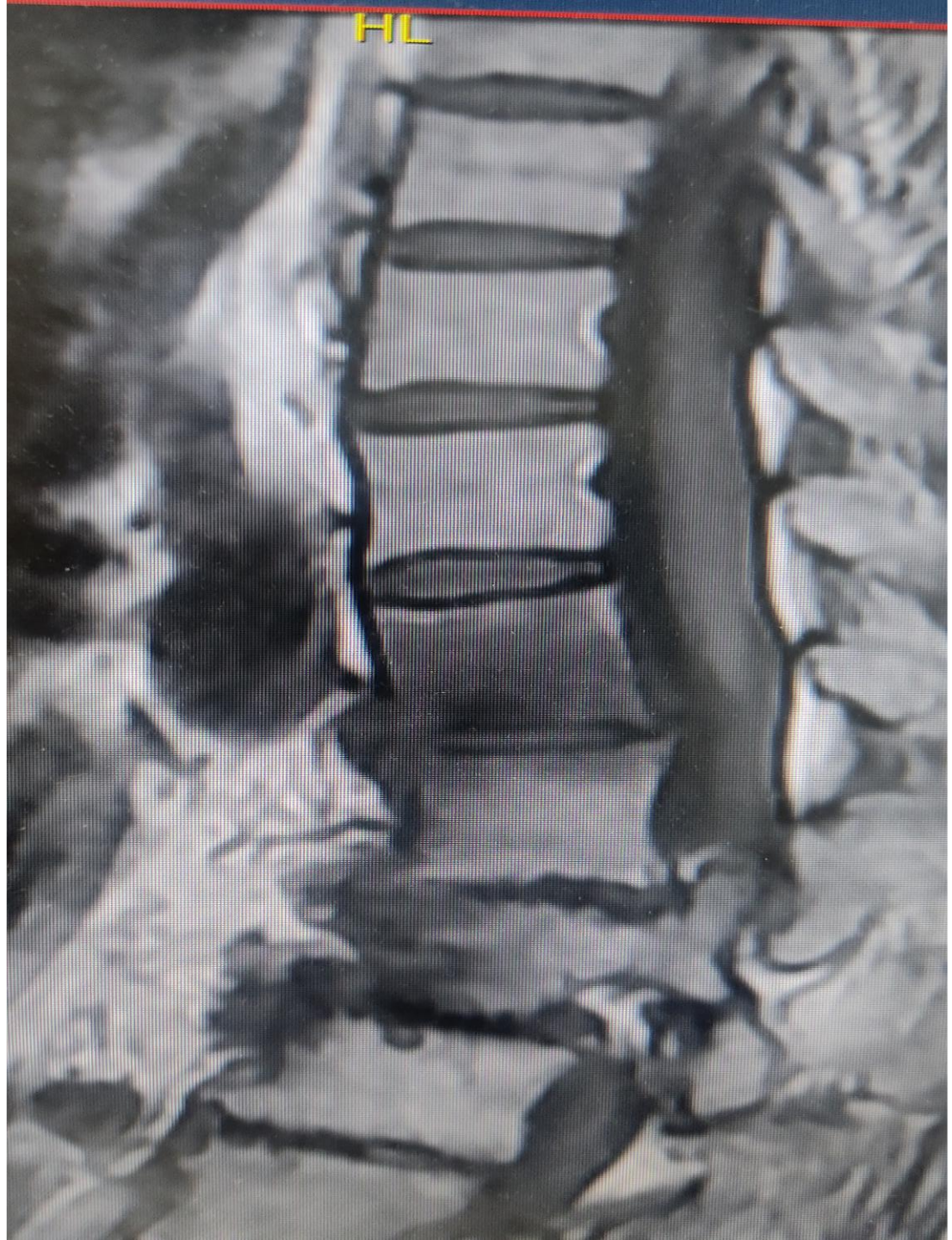
Modic changes	MR T1 weighted	MR T2 weighted	Signification
Modic 1	Low signal	High signal	Marrow edema.
Modic 2	High signal	High signal	Fatty degeneration of subchondral marrow.
Modic 3	Low signal	Low signal	Extensive bony sclerosis

Modic changes



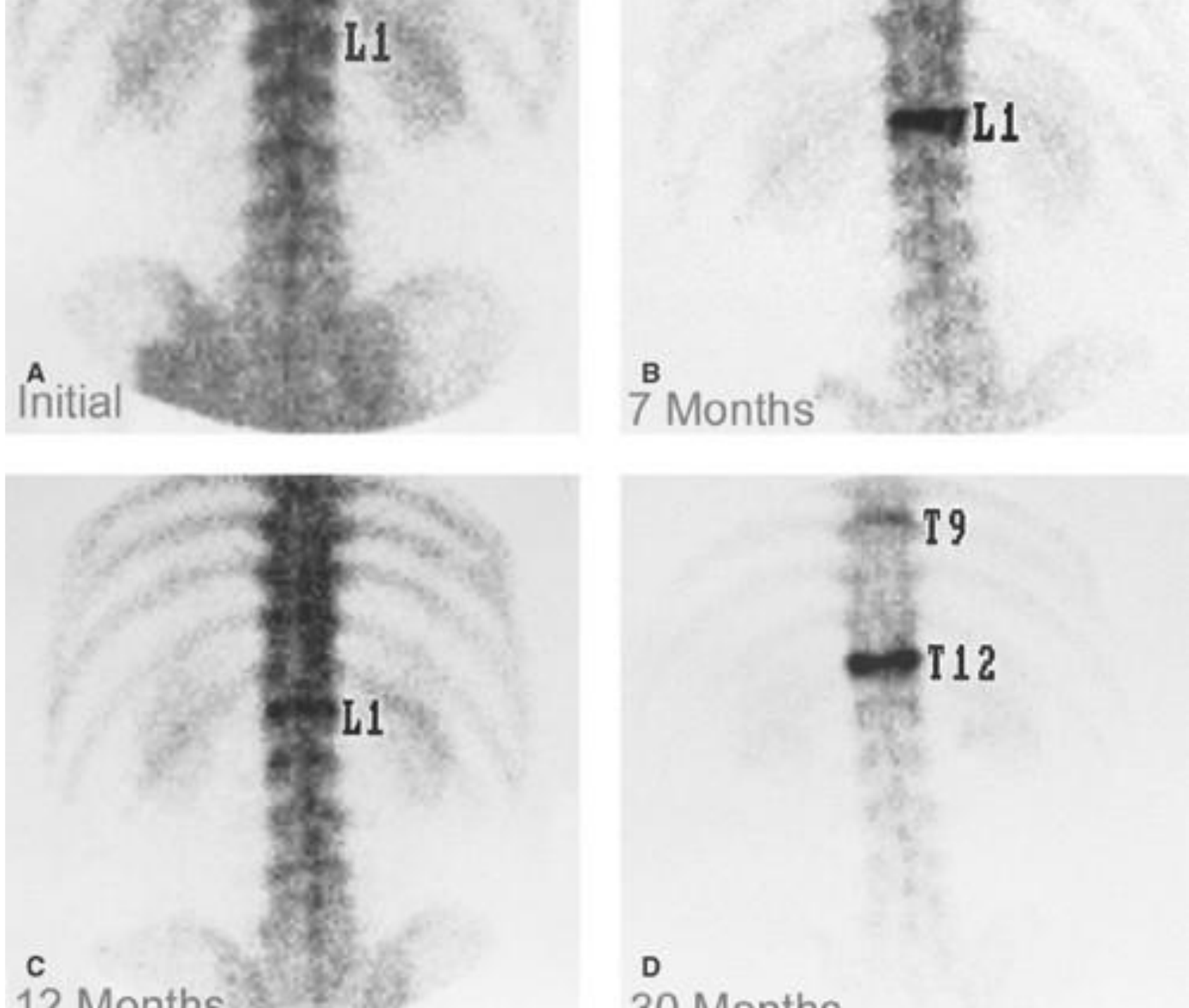

A
B


HL


HL

RADIONUCLEIDE SCANNING

- Radionuclide scans with technetium-99m become positive long before plain film changes are evident
- Gadolinium is a good adjunct. Combination of Tc99m and Ga67 is used shows increased uptake at the site of infection


L1
A
Initial
L1
B
7 Months
L1
C
12 Months
T9
T12
D

Biopsy

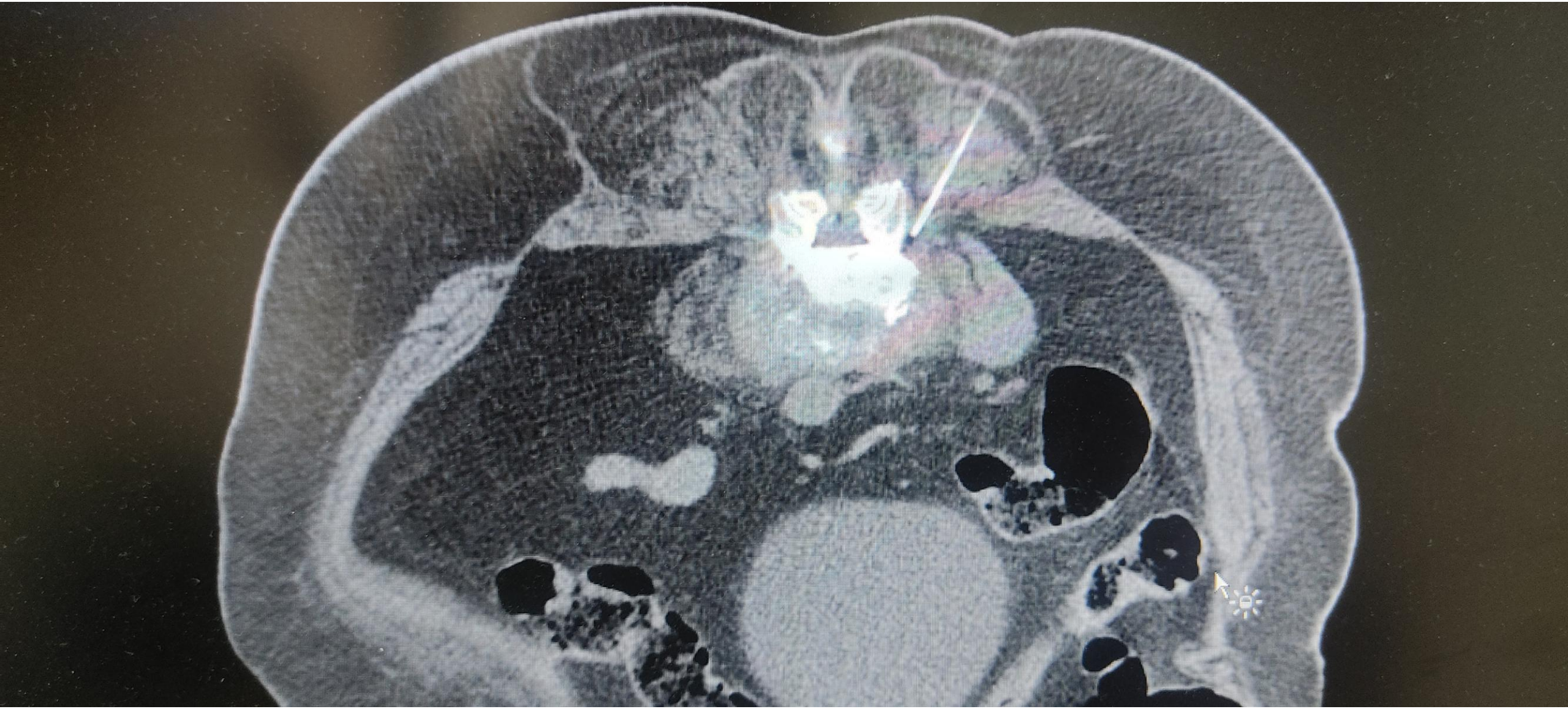
Best method of determining the infection.

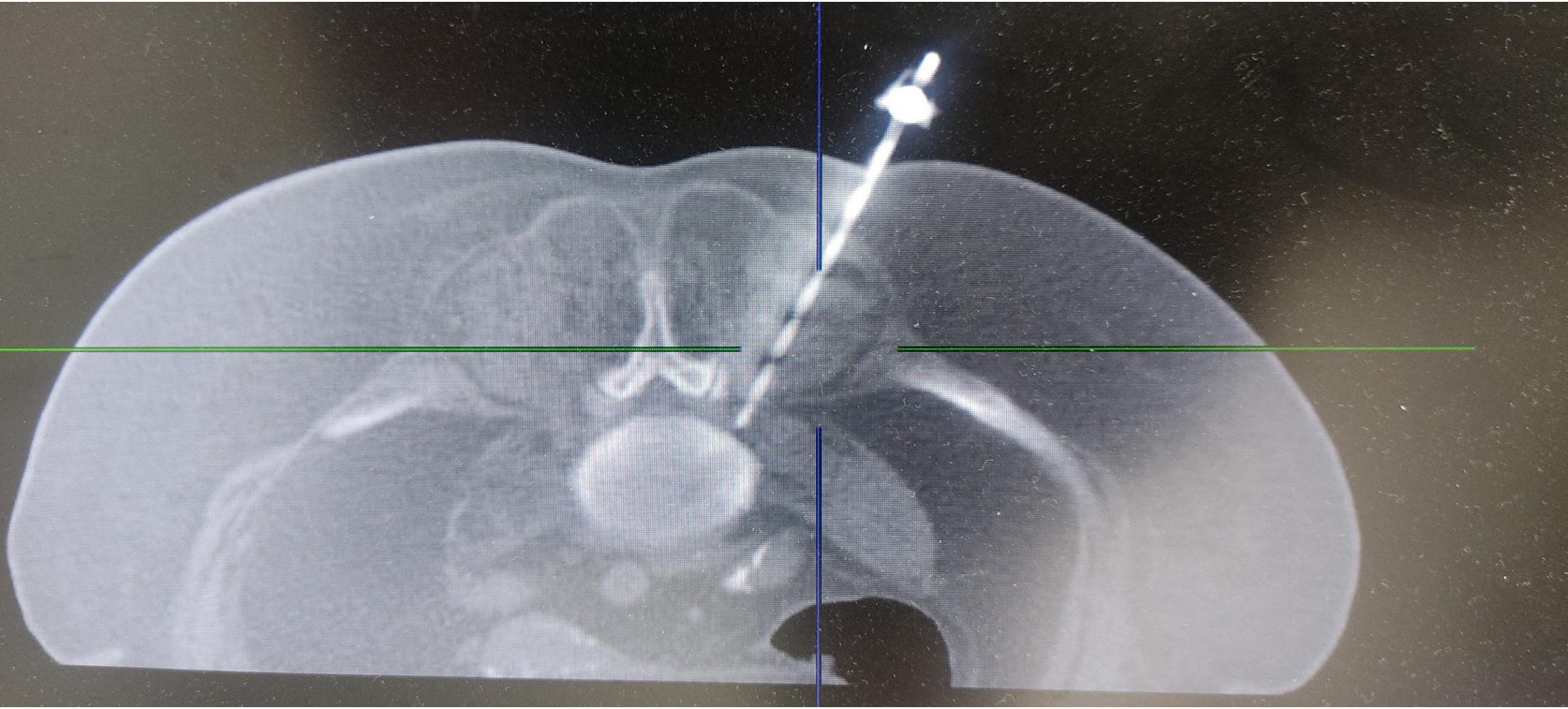
CT guided

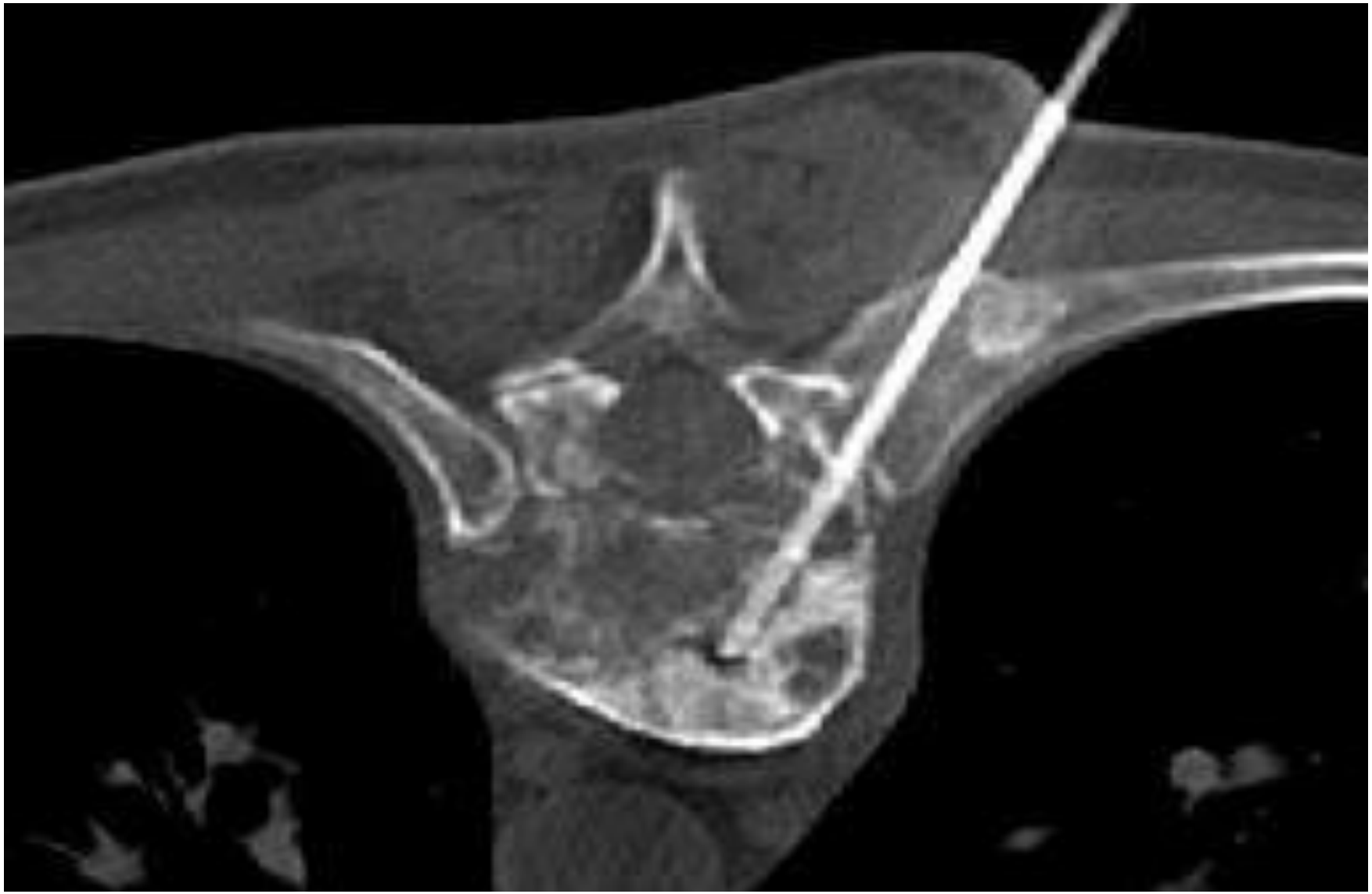
- Minimal invasive

Open biopsy

- If blood cultures and percutaneous biopsy fail to identify the infecting organism.







BRUCELLOSIS

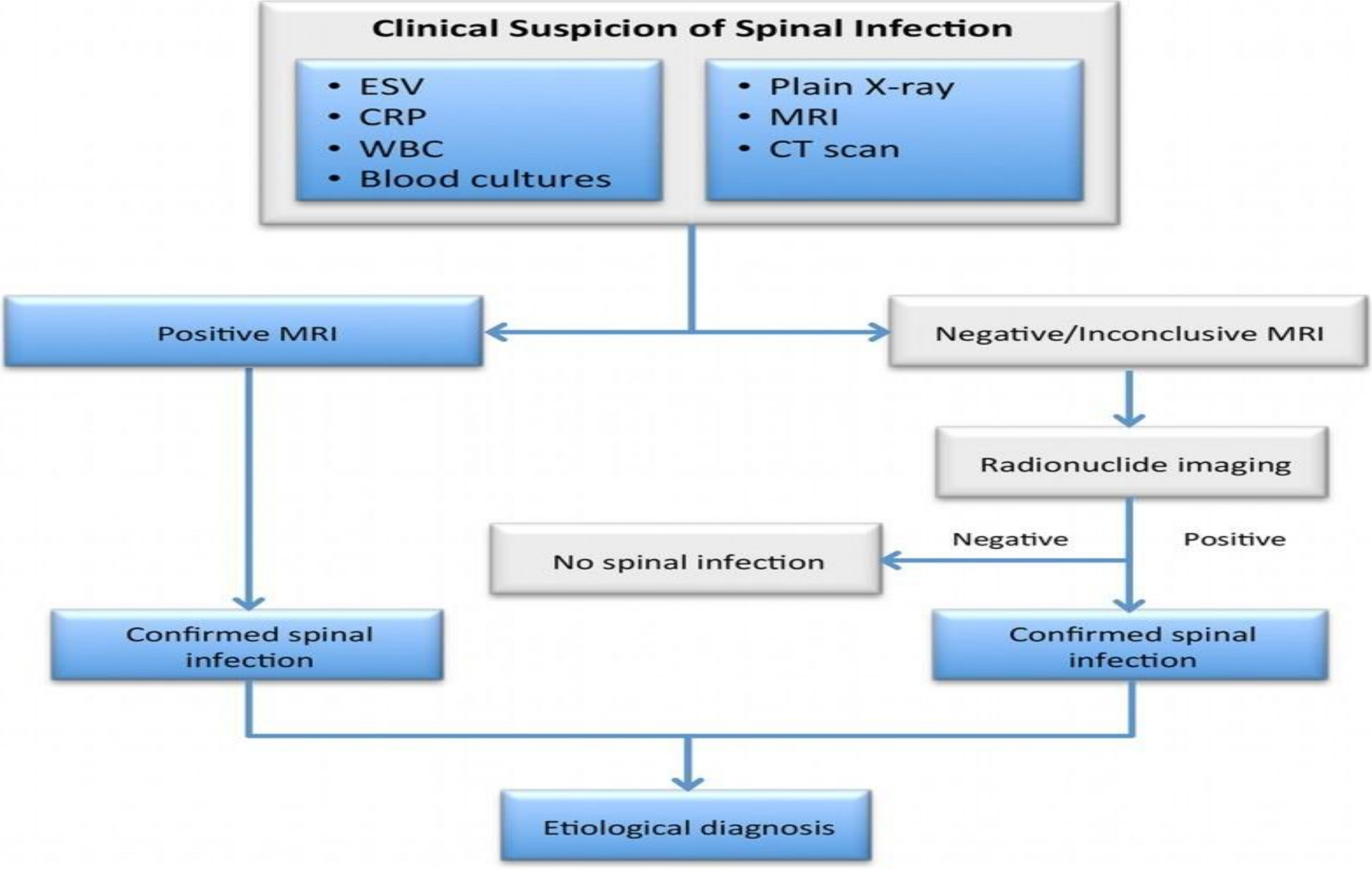
-Brucella melitensis - organism

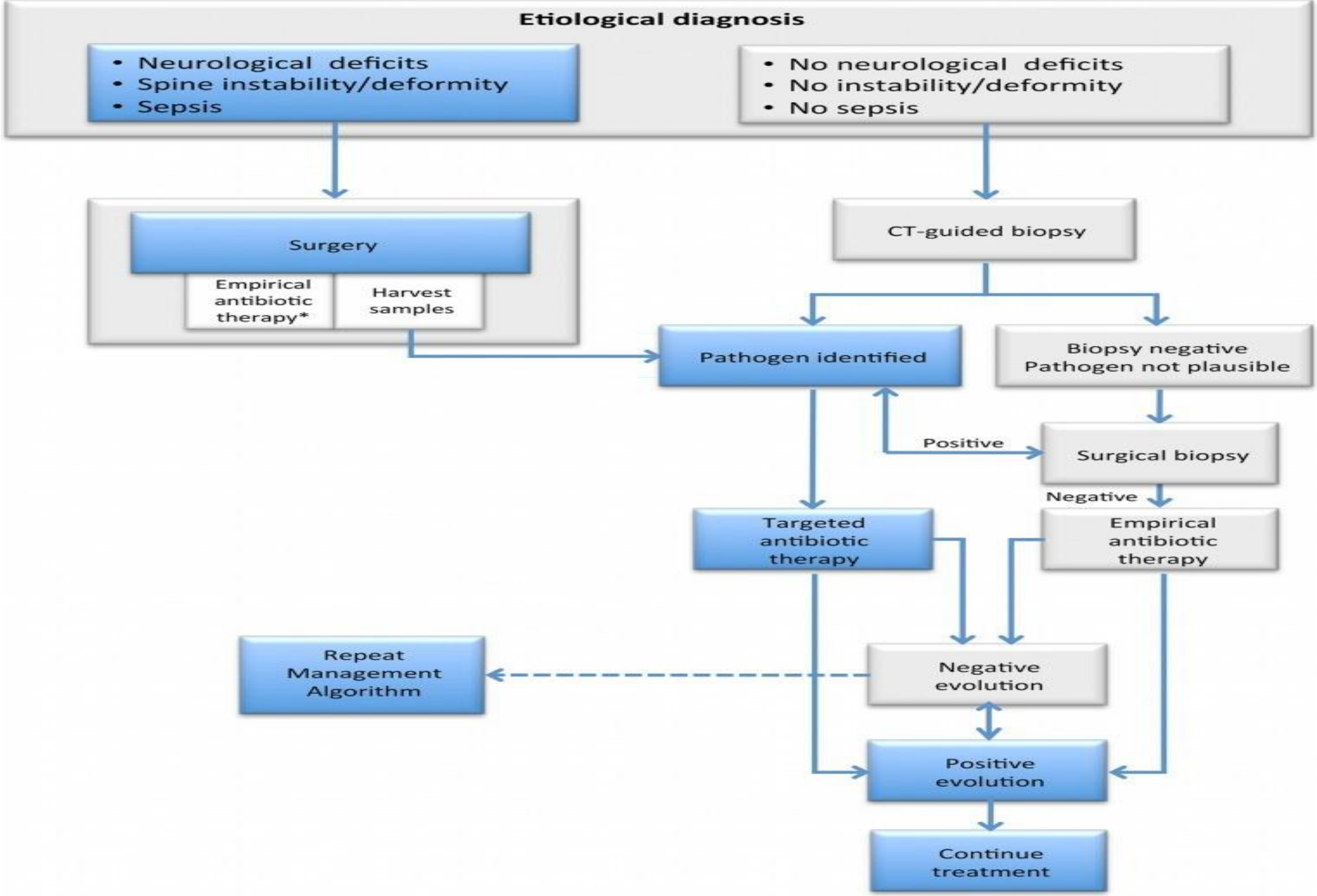
Consumption of unpasteurized milk and soft cheeses made from the milk of infected animals

- Symptoms: polyarthralgia, night sweats, anorexia, headache.
- Psoas abscess is found in 12% of patients
- Lumbar spine most commonly involved

Confirm diagnosis: Titre of brucella >1:80

Treatment: Antibiotics (rifampicin and doxycycline)


Clinical Suspicion of Spinal Infection
• ESV
• CRP
• WBC
• Blood cultures
• Plain X-ray
• MRI
• CT scan
Positive MRI
Negative/Inconclusive MRI
Radionuclide imaging
Negative
Positive
No spinal infection
Confirmed spinal infection
Confirmed spinal infection
Etiological diagnosis


Etiological diagnosis
• Neurological deficits
• Spine instability/deformity
• Sepsis
• No neurological deficits
• No instability/deformity
• No sepsis
Surgery
Empirical antibiotic therapy*
Harvest samples
CT-guided biopsy
Pathogen identified
Biopsy negative
Pathogen not plausible
Positive
Surgical biopsy
Negative
Targeted antibiotic therapy
Empirical antibiotic therapy
Repeat Management Algorithm
Negative evolution
Positive evolution
Continue treatment

MANAGEMENT CONTD..

NON OPERATIVE

 Antibiotics chosen according to culture and sensitivity

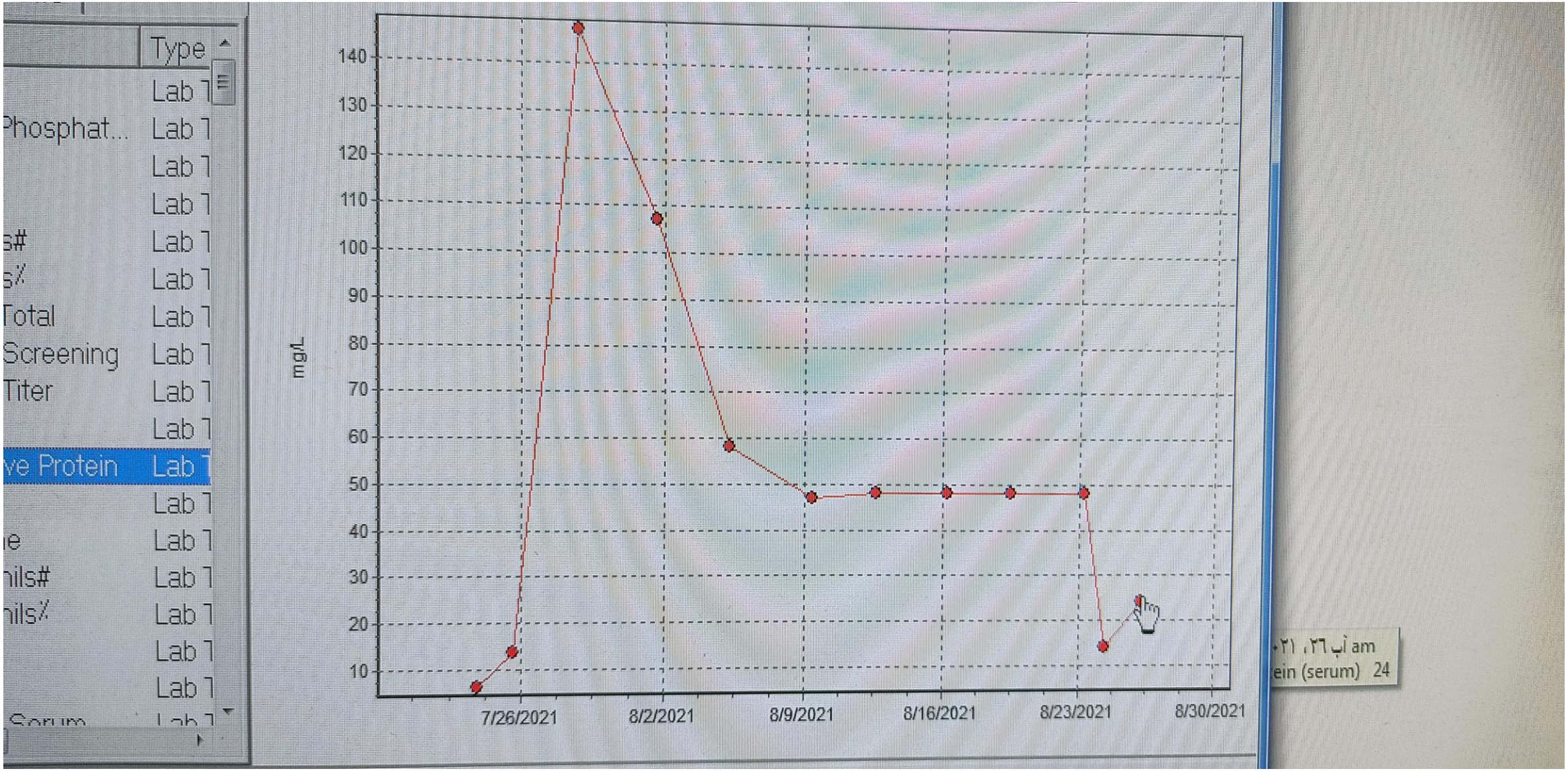
 Response to treatment evaluated with serial CRP.

 Duration: INTRAVENOUS – FOR 4-6 WEEKS followed

by oral antibiotics based on individual response.

INDICATIONS FOR SURGERY

- Open biopsy
- Neurological deficit
- Vertebral collapse
- Abscess
- Failure of medical treatment


Type
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Total
Screening
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mg/L
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130
120
110
100
90
80
70
60
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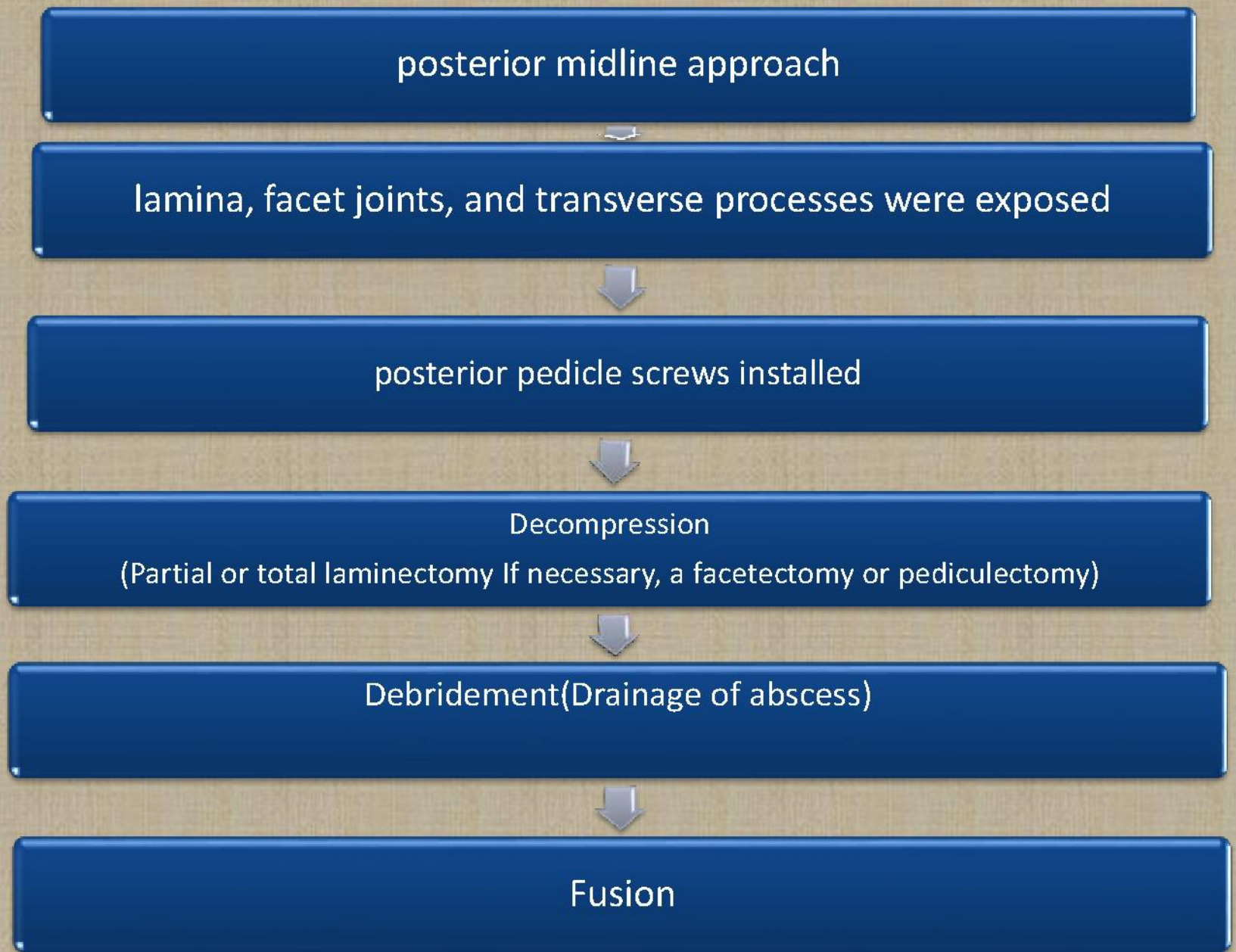
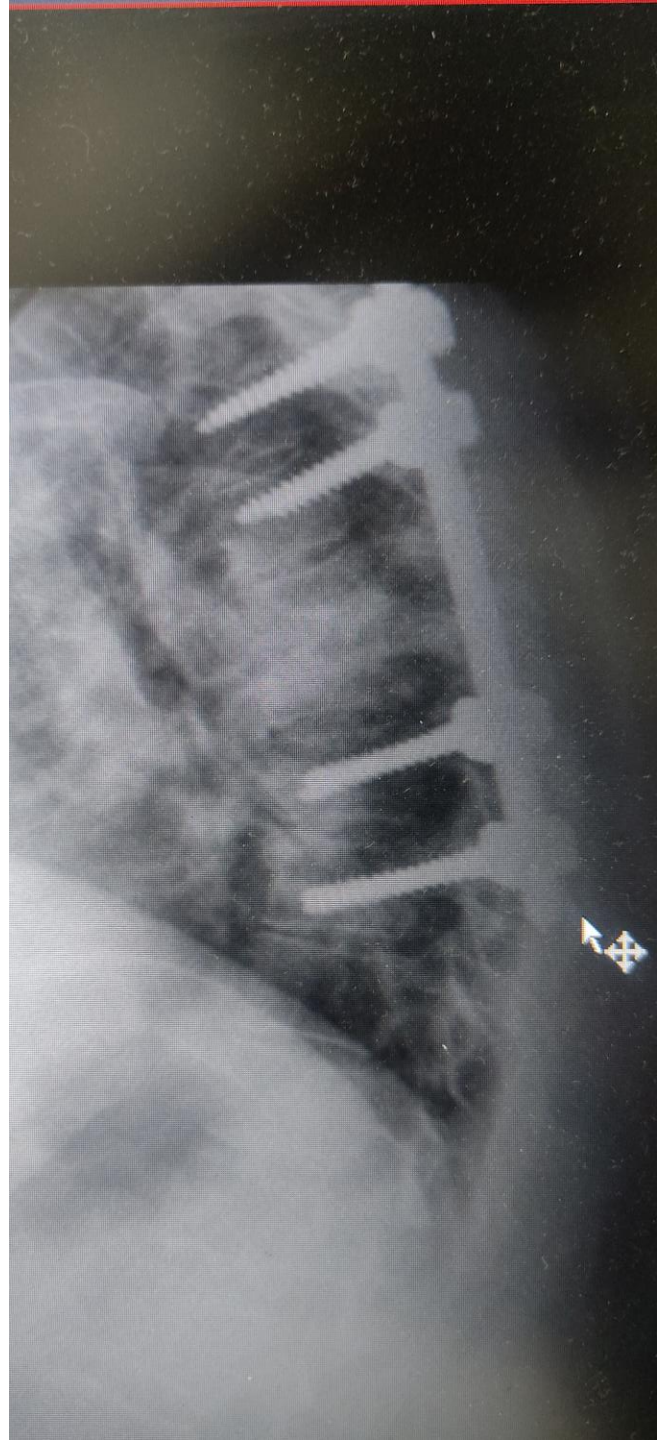
10
7/26/2021
8/2/2021
8/9/2021
8/16/2021
8/23/2021
8/30/2021
am ٢٦ آب ٢٠٢١
ein (serum) 24

SURGICAL STEPS (ALL POSTERIOR)



ADVANTAGES OF ALL POSTERIOR APPROACH

☺ Effective to remove disease process
☺ Safe
☺ Excellent in correcting and maintaining kyphosis
☺ Beneficial for patient in terms of less blood loss, less operative time and short duration of hospitalization compared to combined approach.




By failing to prepare, you are preparing to fail.
Benjamin Franklin
BrainyQuote