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GRUPO DE ESTUDIO DE LA INFECCIÓN OSTEOARTICULAR
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XI Reunión Científica GEIO

Grupo de Estudio de Infección Osteoarticular - SEIMC

Osteomielitis vertebral

Abordaje radiológico al diagnóstico etiológico de la osteomielitis vertebral.
Técnicas y rentabilidad diagnóstica.

José Antonio Narváez

Radiología Musculoesquelética

Hospital Universitari de Bellvitge



Diagnóstico etiológico: Punción en OMV

- Se recomienda realizar una biopsia o una aspiración percutánea guiada por imagen cuando no se haya identificado el microorganismo causante mediante métodos menos invasivos o cuando los resultados se consideren no concluyentes y se cumplan todas las condiciones siguientes:
  - el paciente no requiera una intervención quirúrgica inmediata (pe, debido a un compromiso neurológico o a inestabilidad vertebral);
  - el paciente se encuentra hemodinámicamente estable;
  - se han corregido todos los factores de riesgo de hemorragia que sean corregibles.

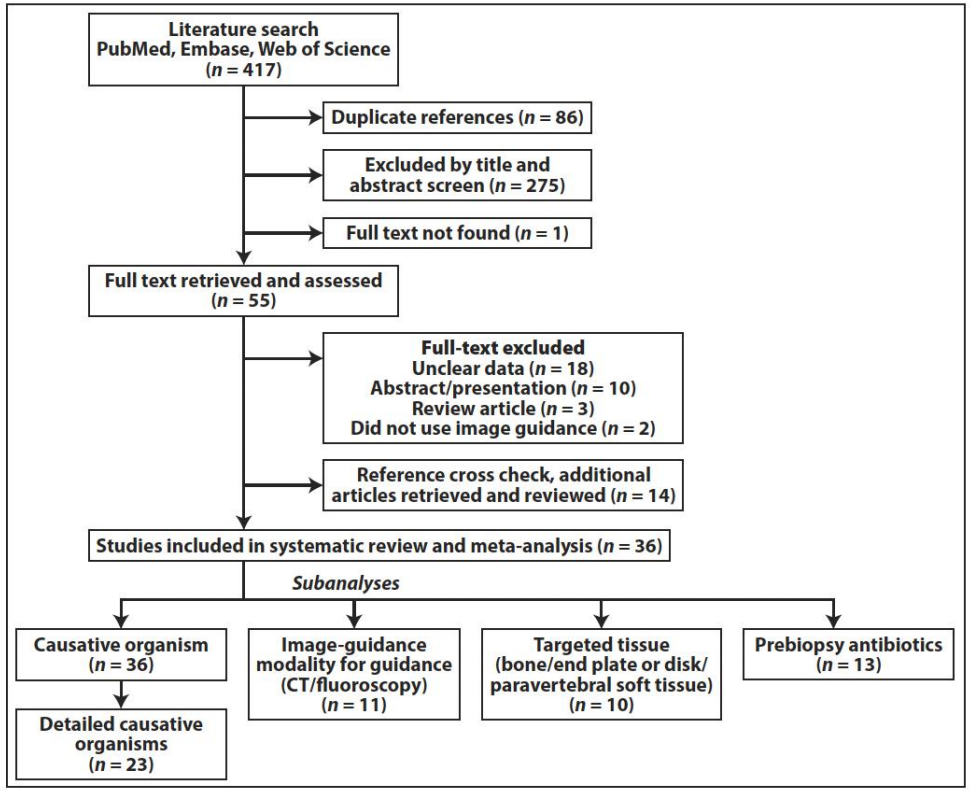
Image-Guided Biopsy in Acute Diskitis-Osteomyelitis: A Systematic Review and Meta-Analysis

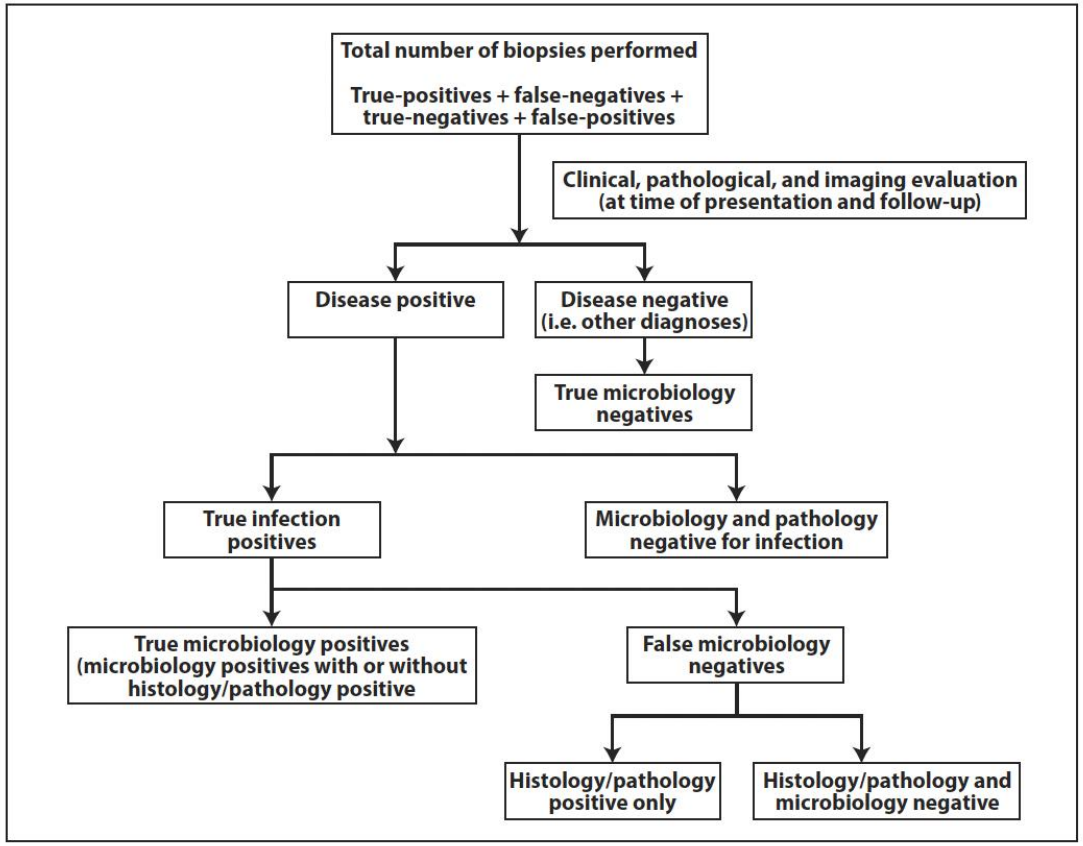
Connie Y. Chang, MD[1], Casey Pelzl, MPH[2], Mary Kate Jesse, MD[3], Sina Habibollahi, MD[1], Ukasha Habib, MD[1], Soterios Gyftopoulos, MD, MBA, MSc[4]

Evidence Synthesis and Decision Analysis · Systematic Review/Meta-Analysis

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AJR:220, April 2023





HIGHLIGHTS

Key Finding

- *Microbiology sensitivity is the most clinically relevant statistic for evaluating efficacy of an image-guided diskitis-osteomyelitis biopsy and is 46.6% according to our analysis. Image-guidance modality and preprocedural antibiotics do not affect microbiology yield, and disk and paravertebral soft-tissue biopsies should be considered, possibly over bone and end plate biopsies.*

Importance

- *Understanding the various statistics used in the literature helps to appropriately interpret results and optimize the care of patients with diskitis-osteomyelitis.*

Image-Guided Biopsy in Acute Diskitis-Osteomyelitis: A Systematic Review and Meta-Analysis

Connie Y. Chang, MD[1], Casey Pelzl, MPH[2], Mary Kate Jesse, MD[3], Sina Habibollahi, MD[1], Ukasha Habib, MD[1], Soterios Gyftopoulos, MD, MBA, MSc[4]

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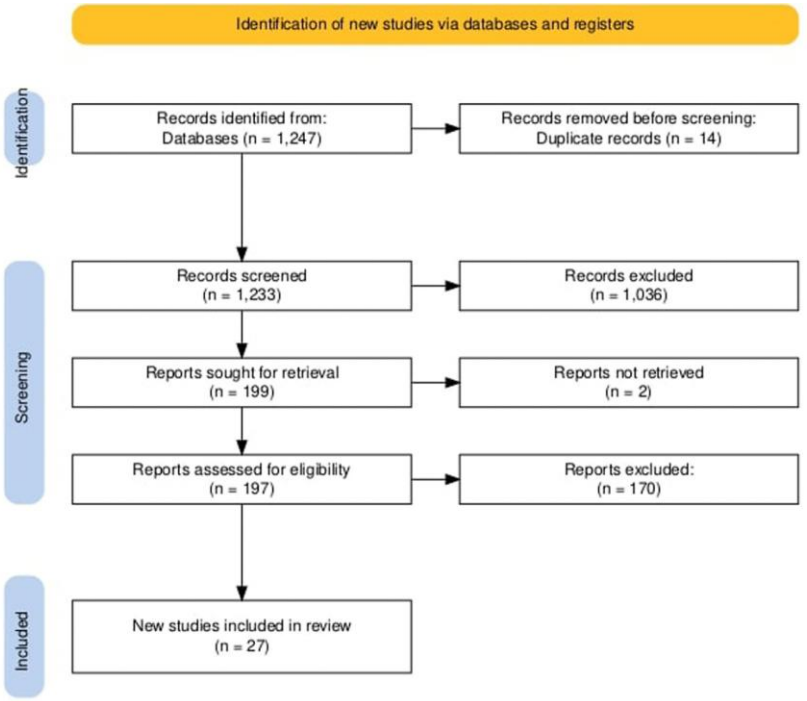
- La sensibilidad microbiológica es el parámetro estadístico de mayor relevancia clínica para evaluar la eficacia de una biopsia de discitis-osteomielitis guiada por imagen y, según este análisis, es del 46,6 %.
- La modalidad de guía por imagen y la administración de antibióticos previos a la intervención no afectan al rendimiento microbiológico.
- Se debe considerar la realización de biopsias del disco y de los tejidos blandos paravertebrales, *antes que* del hueso y de las plataformas vertebrales.

The Spine Journal 26 (2026) 1252–1263

Systematic Review/Meta-Analysis

Network meta-analysis of antibiotic exposure and holiday duration, biopsy site, imaging guidance, and sampling approach on culture yield in vertebral osteomyelitis[1]

Eslam Abourisha, PhD, FRCS[a], Tanmay Jitendra Talavia, MUDr[a,*], Kristine Logan, BSc, MSc[a], Sanjeevi Bharadwaj, MRCS, MSc[b], Amit Bishnoi, MBBS, FRCS[a], Sriram Harish Srinivasan, FRCS[c]



Systematic Review/Meta-Analysis

Network meta-analysis of antibiotic exposure and holiday duration, biopsy site, imaging guidance, and sampling approach on culture yield in vertebral osteomyelitis[1]

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- En este metaanálisis se incluyeron un total de 27 estudios de cohortes en adultos.
- En 12 cohortes (n = 967 biopsias), la exposición previa a antibióticos no se asoció con una diferencia estadísticamente significativa en el rendimiento del cultivo (RR combinado 0,86; 95 %- IC 0,72 -1,03).
- Una nueva biopsia programada tras un primer intento con resultado negativo mostró indicios de beneficio, pero no se alcanzó significación estadística.

Systematic Review/Meta-Analysis

Network meta-analysis of antibiotic exposure and holiday duration, biopsy site, imaging guidance, and sampling approach on culture yield in vertebral osteomyelitis[1]

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- Siempre que sea posible (por ejemplo, en ausencia de sepsis, inestabilidad hemodinámica o compromiso neurológico), la punción debe realizarse antes de iniciar el tratamiento antimicrobiano.
- Si ya se ha iniciado un tratamiento antibiótico empírico, es recomendable —cuando sea clínicamente viable— suspenderlo durante varios días antes de la intervención; puede considerarse un mínimo de cuatro días.
- Las directrices de la IDSA de 2015 recomiendan suspender los antibióticos durante 1-2 semanas en pacientes estables sin complicaciones neurológicas. Un estudio más reciente demostró que existe una relación entre la duración del periodo sin antibióticos y el rendimiento microbiológico, con las tasas de detección más bajas durante los tres primeros días y tasas progresivamente más altas a partir de entonces. Se ha sugerido un periodo sin antibióticos de al menos cuatro días para optimizar el rendimiento diagnóstico.

Systematic Review/Meta-Analysis

Network meta-analysis of antibiotic exposure and holiday duration, biopsy site, imaging guidance, and sampling approach on culture yield in vertebral osteomyelitis[1]

- Cuando hay una colección líquida o un absceso, se recomienda la aspiración de líquido debido a su mayor rendimiento microbiológico.
- Se debe dar preferencia a las muestras de tejido blando discal o paravertebral frente a las biopsias óseas/de platillos vertebrales, debido a su mayor rendimiento diagnóstico.

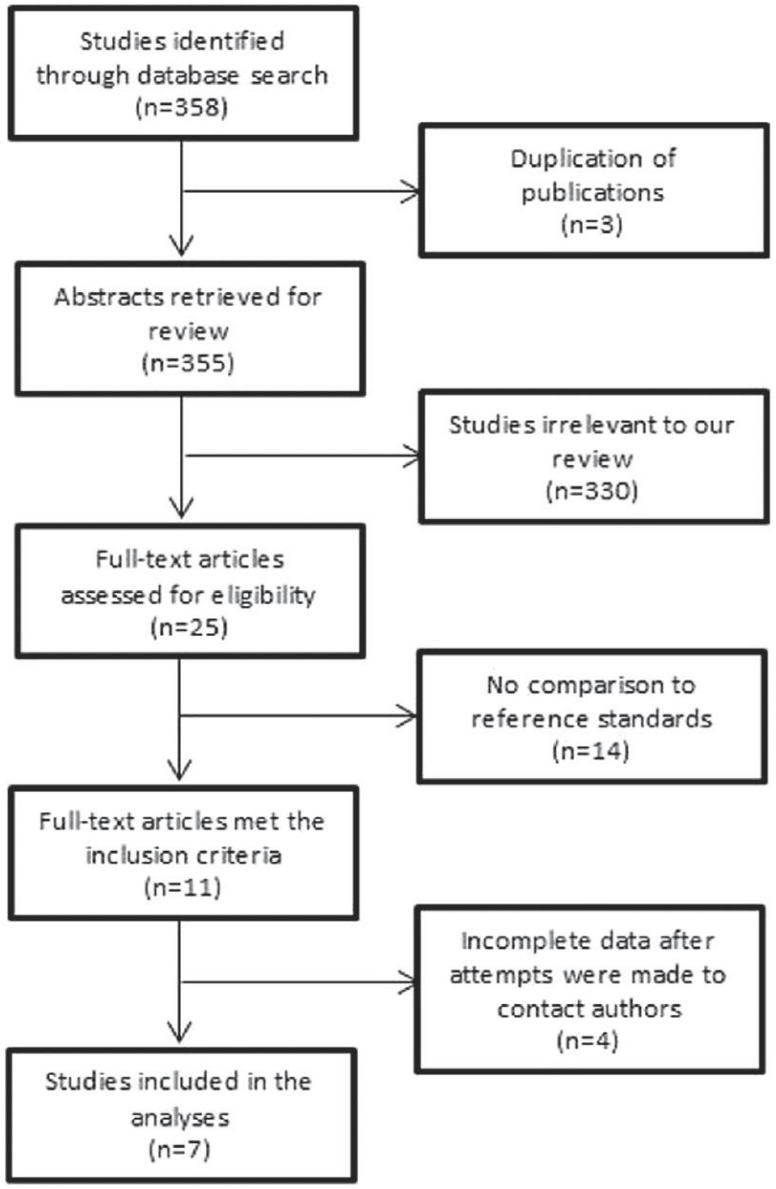
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The Spine Journal 15 (2015) 122–131
THE SPINE JOURNAL

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Clinical Study

The utility of image-guided percutaneous needle aspiration biopsy for the diagnosis of spontaneous vertebral osteomyelitis: a systematic review and meta-analysis

Jakrapun Pupaibool, MD[a,*], Shawn Vasoo, MD[b], Patricia J. Erwin, MLS[c], Mohammad Hassan Murad, MD[d], Elie F. Berbari, MD[a]



Context
The efficacious treatment of spondylodiscits and vertebral osteomyelitis often necessitates a biopsy in order to identify the infectious organism. CT guided biopsy, however, is not always able to yield positive cultures. In such settings, open, or percutaneous, vertebral biopsy is necessary. The diagnostic accuracy of image-guided needle biopsy is assessed in this systematic review and meta-analysis.

Contribution
The authors included seven investigations with a total of 482 patients. Pooling was limited to only five studies. The diagnostic odds ratio, sensitivity and specificity of image-guided needle biopsy are presented.

Implications
The authors' results are predicated on the appropriateness of combined reference standards, which is not necessarily the case. Moreover, a meta-analysis is only as good as the studies selected for pooling. The ideal meta-analysis would consist of only randomized, prospective, controlled investigations. By including works with substantial clinical and temporal (1996-2013) heterogeneity, the potential for bias to have been introduced in the meta-analysis cannot reliably be controlled for by the authors.

The Editors

Conclusions

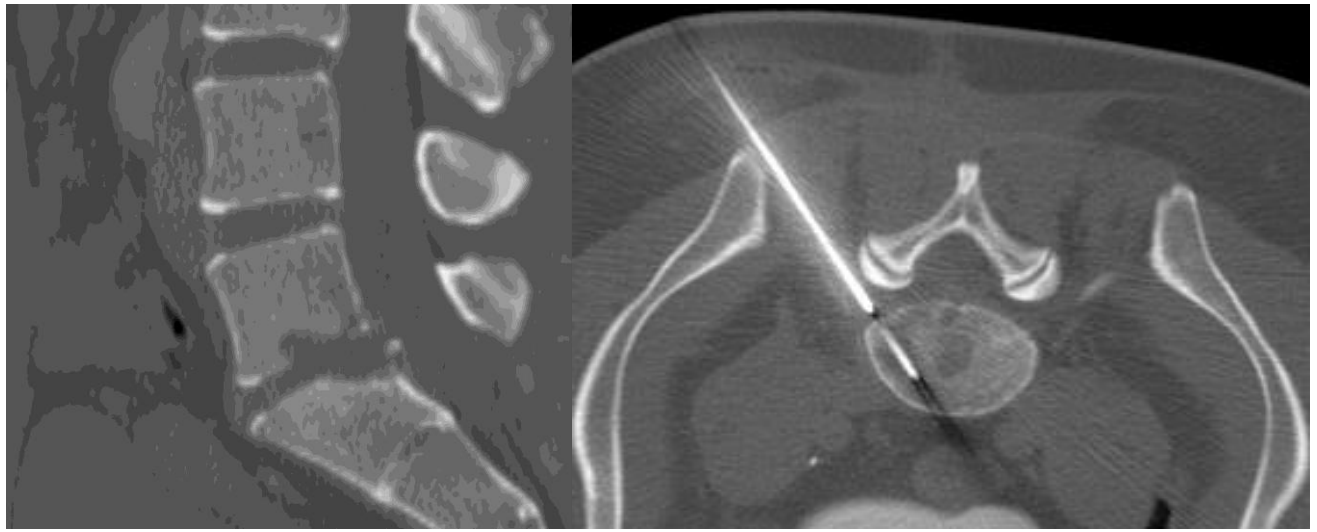
Since intraoperative tissue histopathology and cultures, which are the ideal reference tests for diagnosis of VOM, cannot be achieved in all patients with clinical and radiologic suspicion of SVOM, the combination of multiple modalities are reasonable to be reference standards for the diagnosis of SVOM. Image-guided percutaneous needle aspiration biopsy performed well in predicting a diagnosis of SVOM, but had moderate accuracy for ruling out this diagnosis. Image-guided percutaneous needle aspiration biopsy should be considered as a part of diagnostic work-ups for these patients. The results of our study reinforce the value of image-guided percutaneous spinal biopsy.

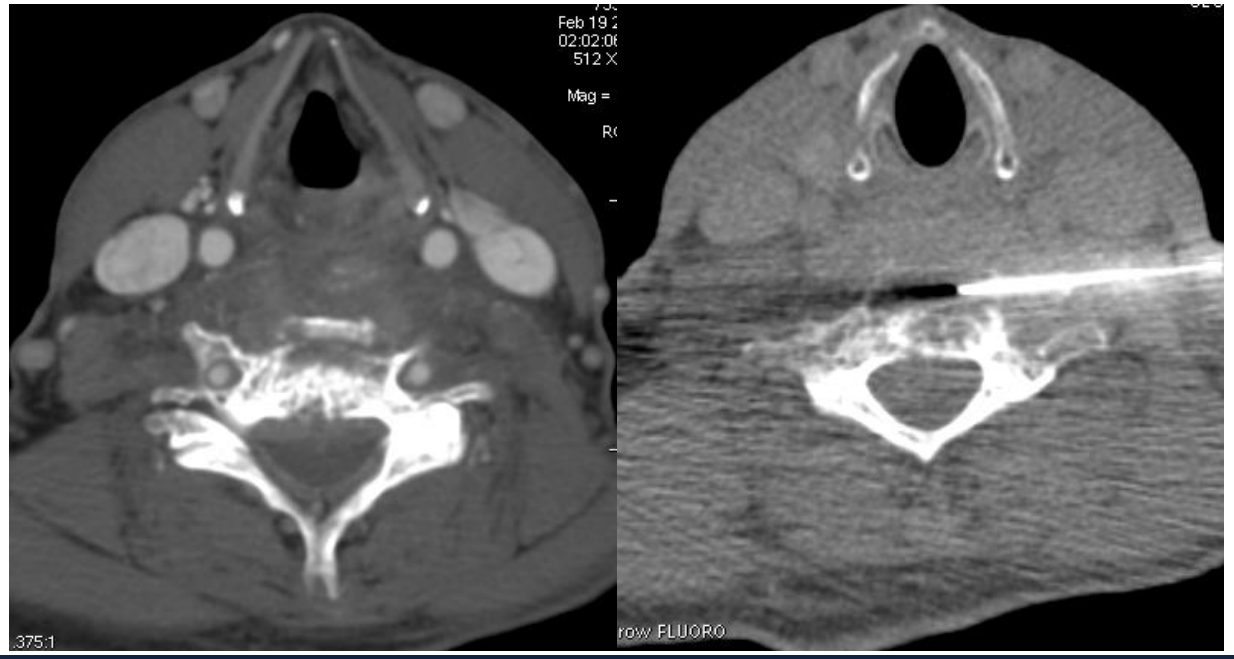
Punción percutánea en OM vertebral

- La punción puede realizarse bajo guía de tomografía computarizada (TC) o fluoroscopia.
- Según un metaanálisis reciente, ambas técnicas ofrecen una eficacia diagnóstica microbiológica similar en pacientes con sospecha de OVN.

Punción percutánea en OM vertebral

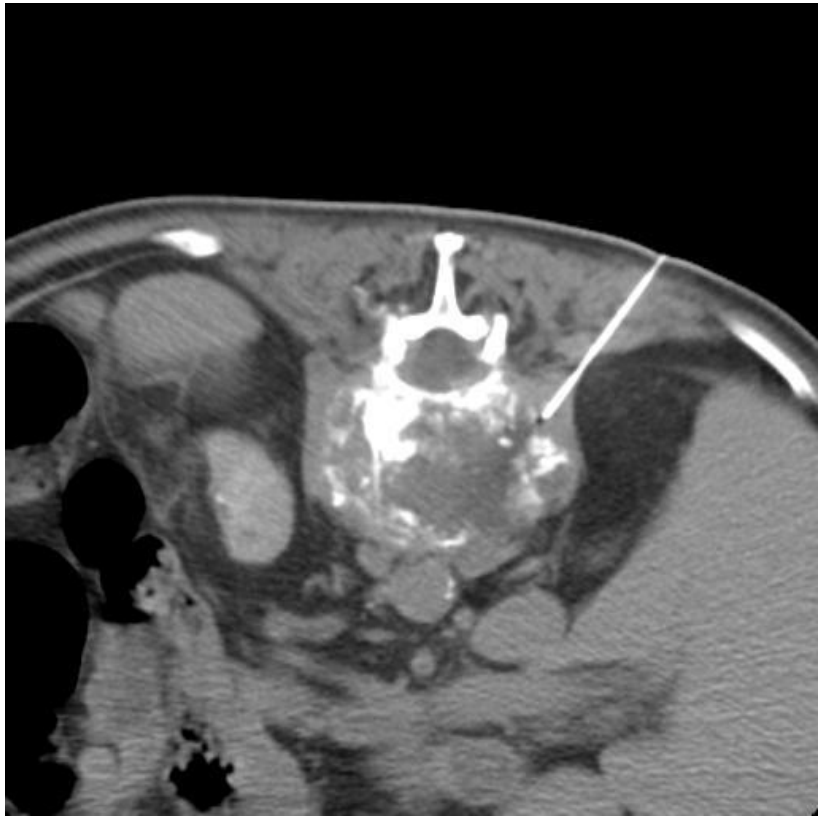
- Se estima que la tasa de diagnóstico de la biopsia o la aspiración percutánea guiada por imagen es de aproximadamente el 50 %.
- Según estos metaanálisis, la sensibilidad de la biopsia guiada por imagen para el análisis microbiológico fue del 52,2 % (5 estudios/482 pacientes), del 48 % (33 estudios/1.763 biopsias) y del 46,6 % (20 estudios).
- En una revisión sistemática (11 artículos/647 biopsias), la tasa de positividad de los cultivos en las biopsias guiadas por TC en casos de sospecha de infección espinal fue del 33 %.

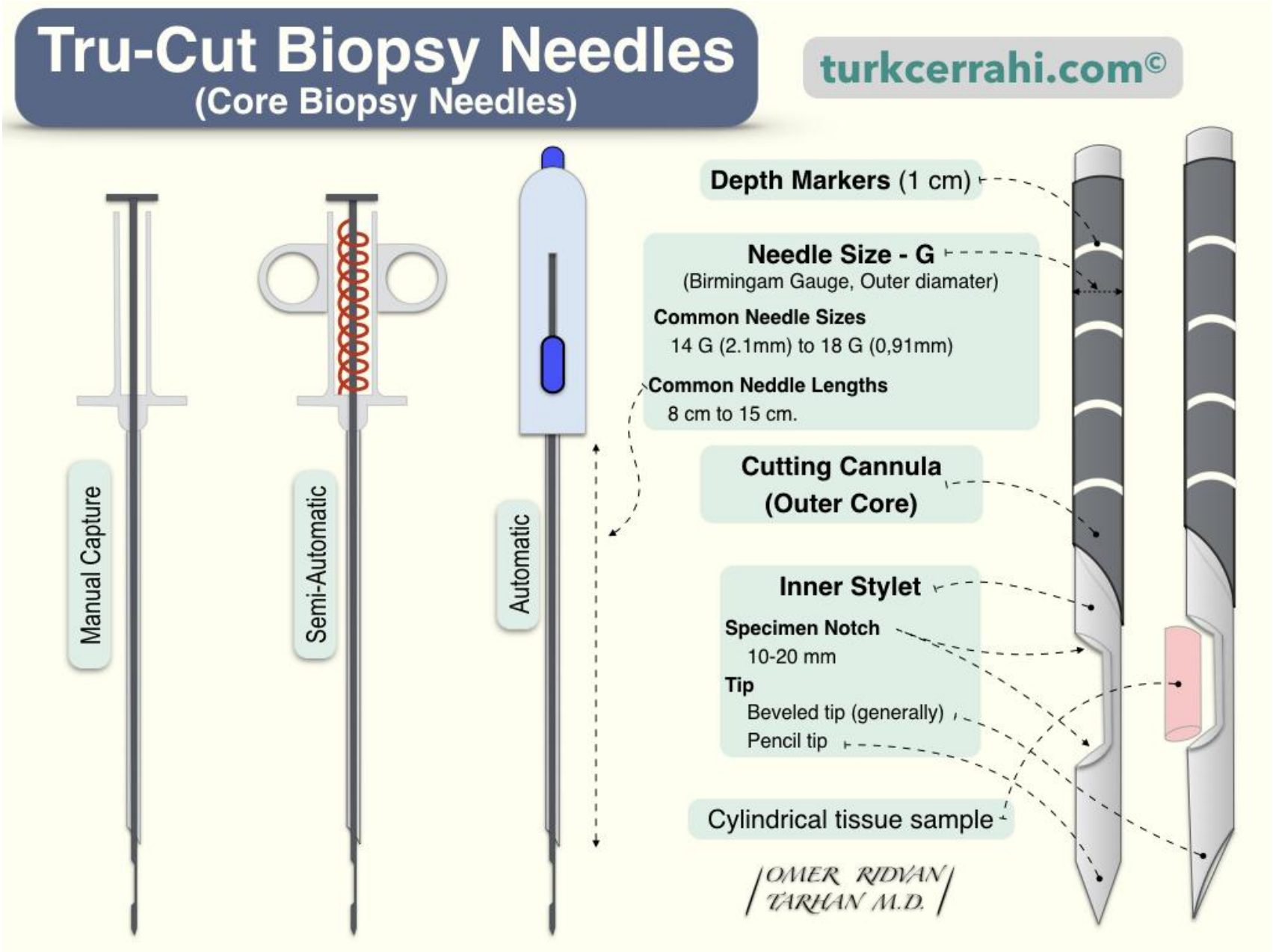



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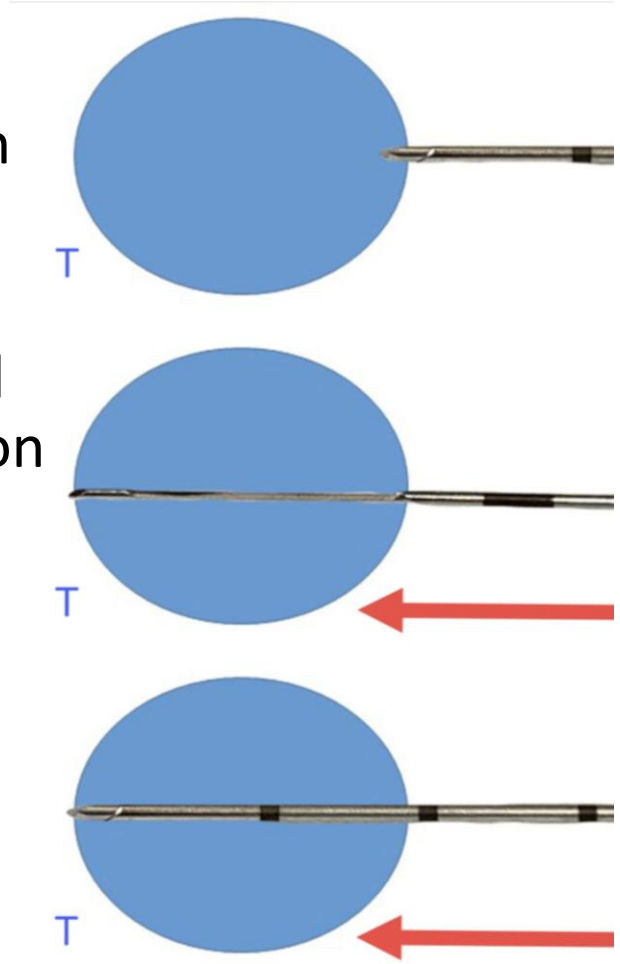

Tru-Cut Biopsy Needles
(Core Biopsy Needles)
turkcerrahi.com©
Manual Capture
Semi-Automatic
Automatic
Depth Markers (1 cm)
Needle Size - G
(Birmingam Gauge, Outer diamater)
Common Needle Sizes
14 G (2.1mm) to 18 G (0,91mm)
Common Neddle Lengths
8 cm to 15 cm.
Cutting Cannula
(Outer Core)
Inner Stylet
Specimen Notch
10-20 mm
Tip
Beveled tip (generally)
Pencil tip
Cylindrical tissue sample
OMER RIDVAN TARHAN M.D.

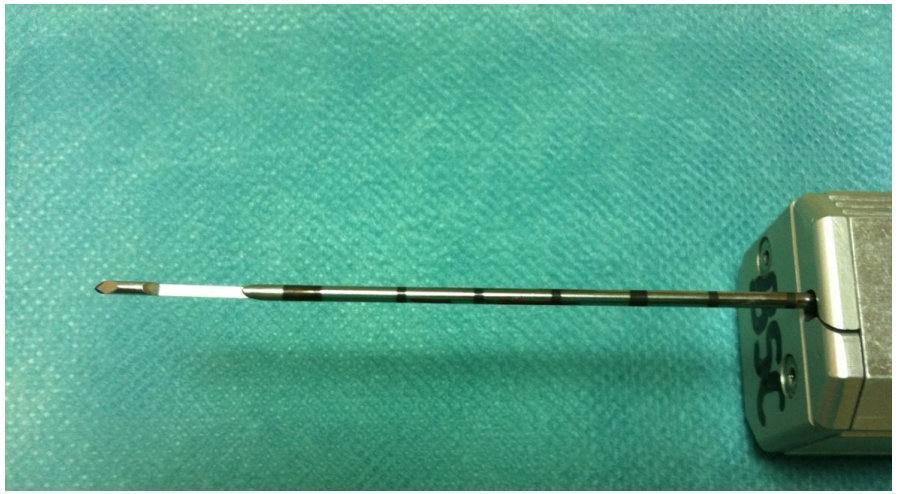

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BAG: corte automático

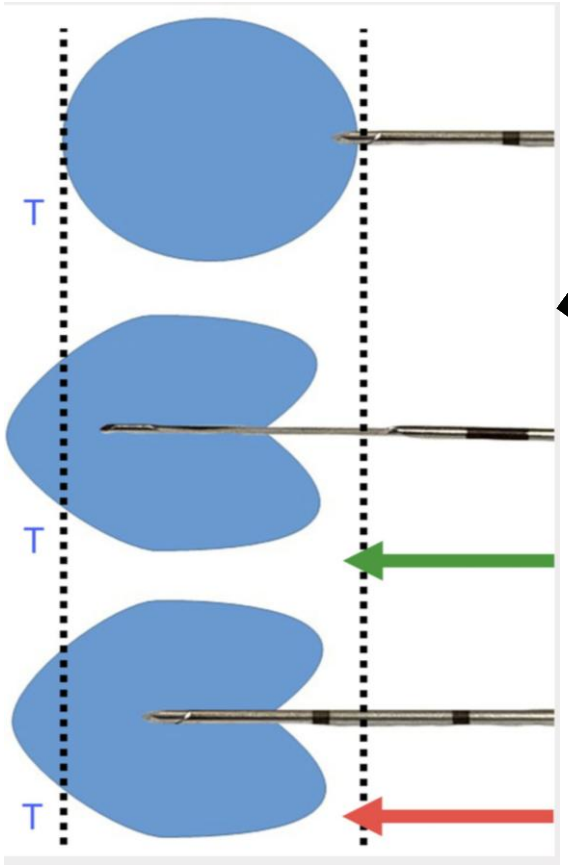
- El recorrido del trocar interno se selecciona en función del tamaño tumoral: 10-30 mm
- En forma automática, el trocar interno avanza con fuerza, capturando el tejido, seguido del avance de la cánula externa.

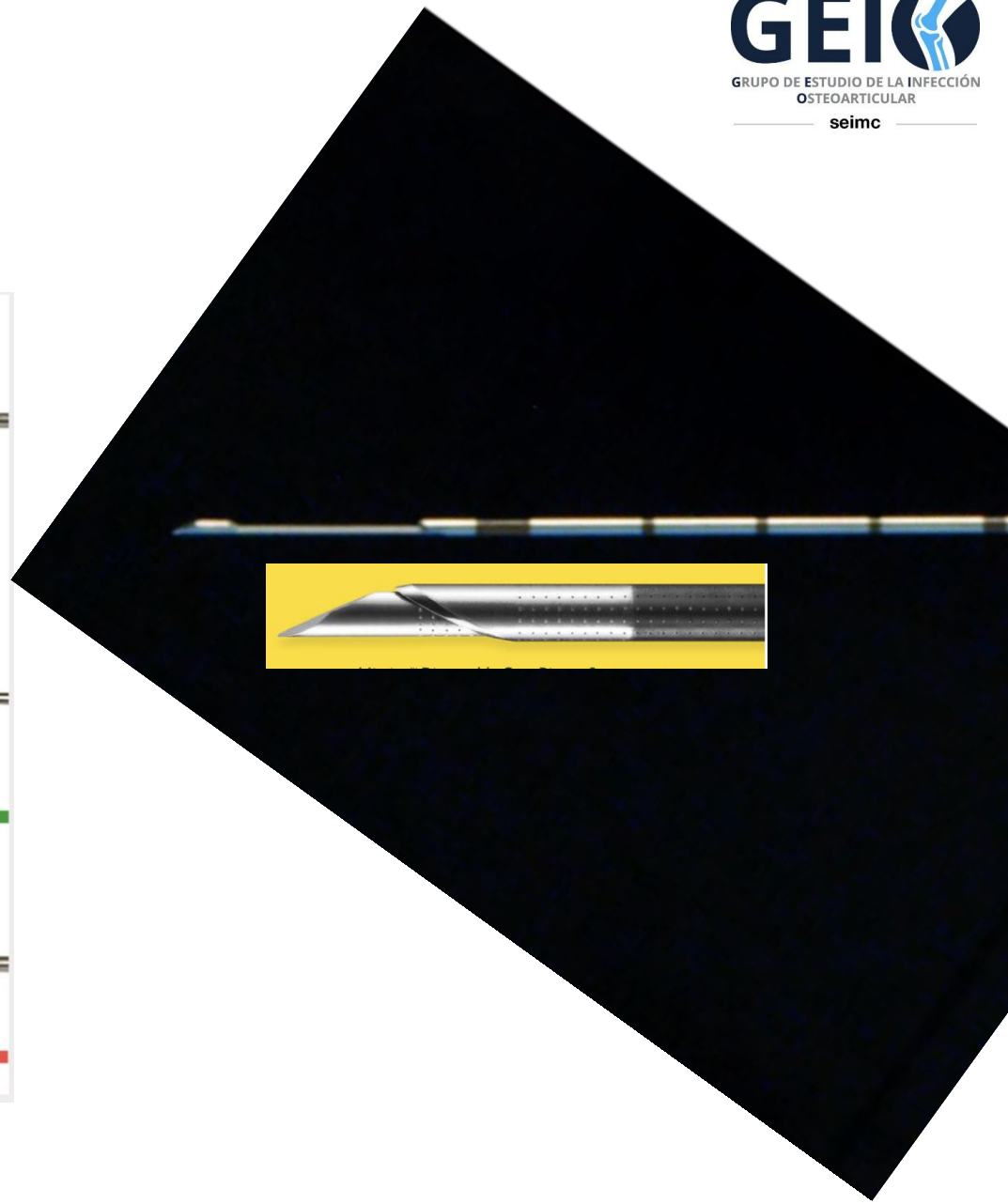




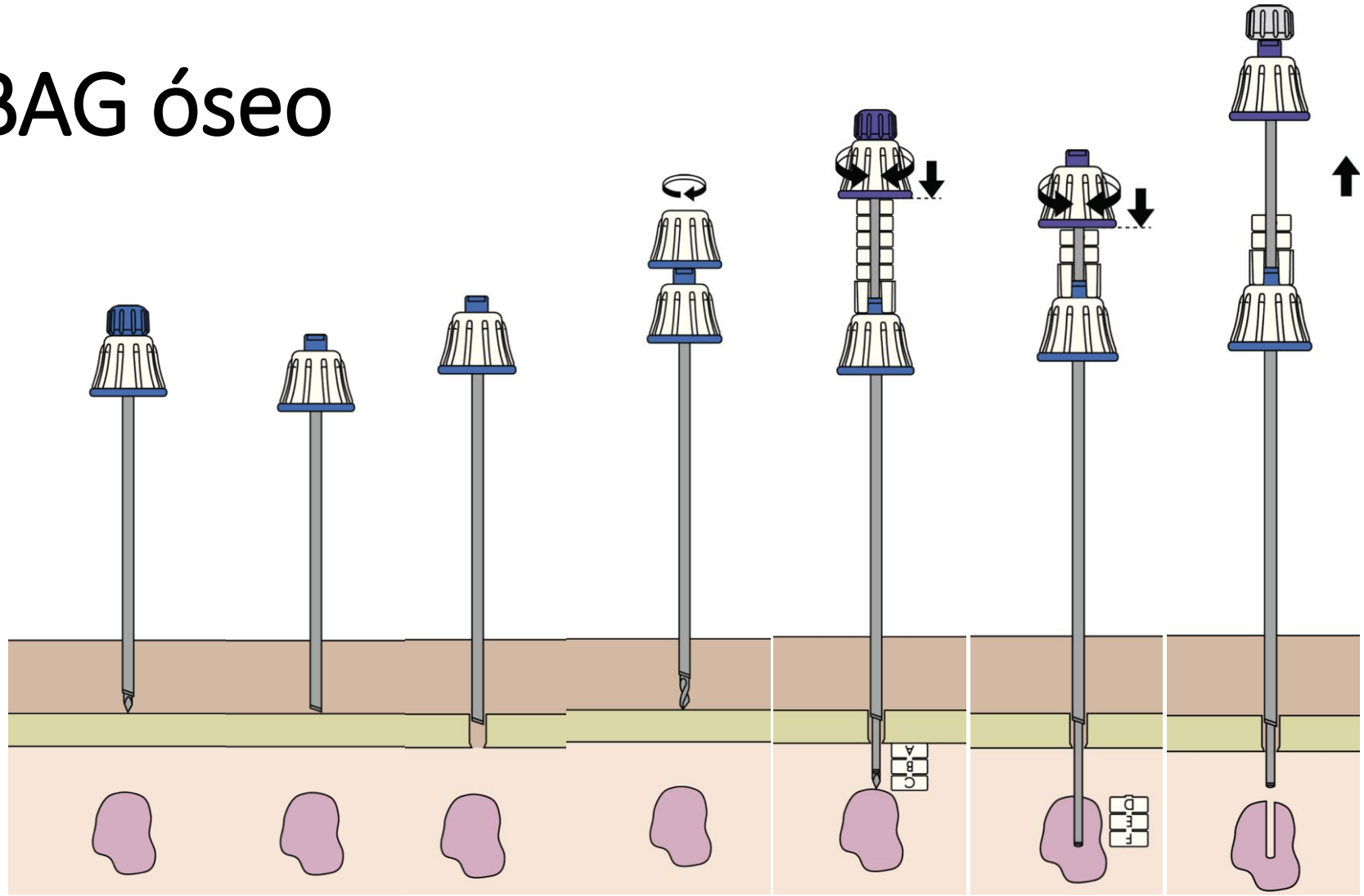
BAG: corte semiautomático

- El recorrido del trocar interno se selecciona en función del tamaño tumoral: 10-20 mm.
- El trocar interno avanza la distancia seleccionada empujado manualmente; el tumor se desplaza en sentido del avance del trócar.
- Cuando el trócar interno ha avanzado, se acciona el sistema, se dispara la cánula externa para el corte del tejido.





BAG óseo




11G
3mm
CE 0124

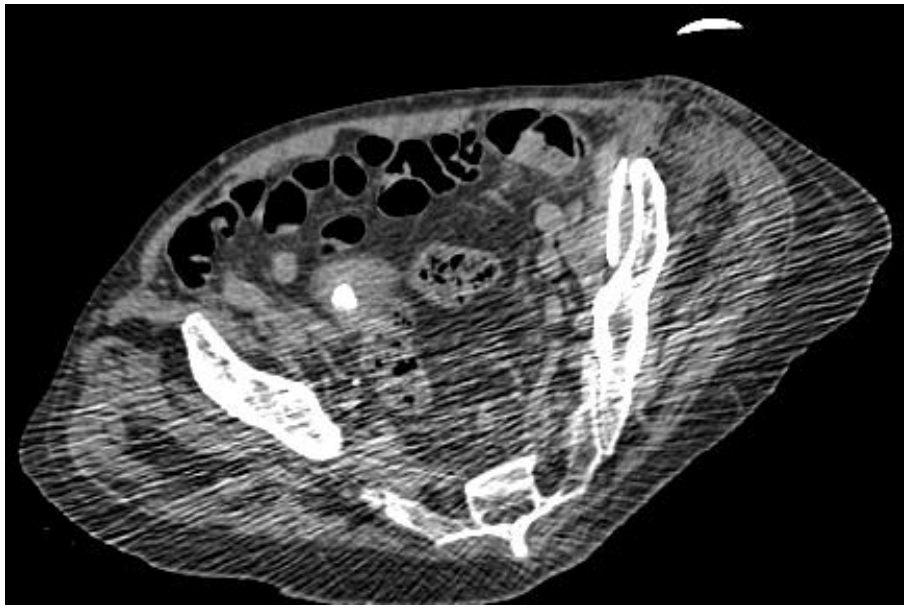


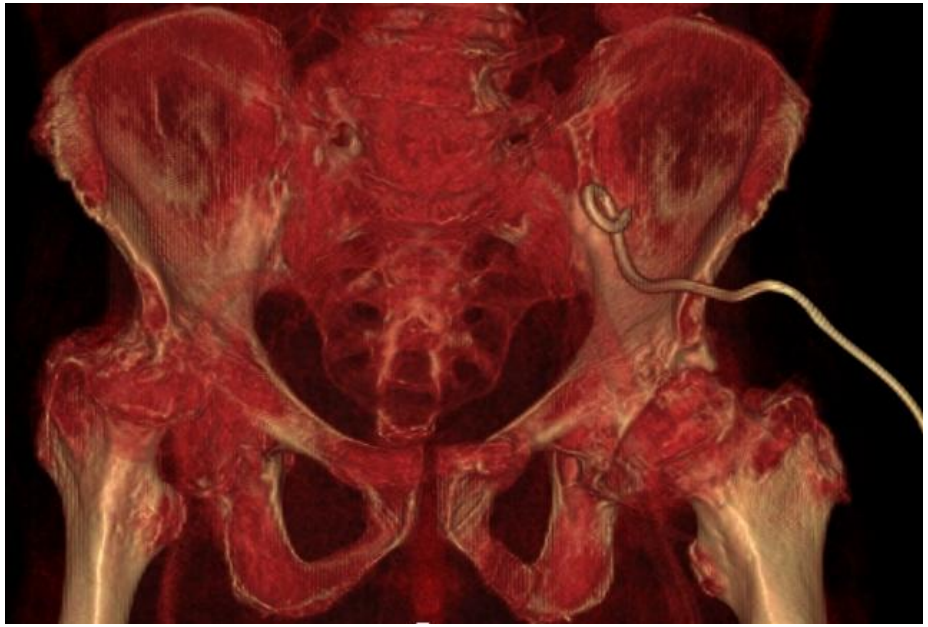












Is Biopsying the Paravertebral Soft Tissue as Effective as Biopsying the Disk or Vertebral Endplate? 10-Year Retrospective Review of CT-Guided Biopsy of Diskitis-Osteomyelitis

Connie Y. Chang[1]
F. Joseph Simeone[1]
Sandra B. Nelson[2]
Atul K. Taneja[3]
Ambrose J. Huang[1]

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AJR:205, July 2015

OBJECTIVE. The purpose of this study was to determine whether there is a difference in biopsying bone (endplate), disk, or paravertebral soft tissue to culture the pathogenic organism causing diskitis-osteomyelitis.

MATERIALS AND METHODS. A retrospective review was conducted of 111 spinal biopsies performed between 2002 and 2011. Pathologic examination was used as the reference standard for detecting diskitis-osteomyelitis. Microbiologic yield, sensitivity, and specificity were calculated. The yields for different groups were compared by use of Fisher exact test. The analysis was repeated with biopsy samples from patients not being treated with antibiotics at the time of biopsy.

RESULTS. A total of 122 biopsy specimens were obtained from 111 spinal biopsy procedures on 102 patients. Overall, 27 (22%) biopsies were performed on the endplate-disk, 61 (50%) on the disk only, and 34 (28%) on paravertebral soft tissue only. The microbiologic yield was 36% for all biopsies, 19% for endplate-disk biopsies, 39% for disk-only biopsies, and 44% for soft-tissue biopsies. The sensitivity and specificity of the microbiologic results for all specimens were 57% and 89%; endplate-disk, 38% and 86%; disk only, 57% and 89%; and paravertebral soft tissue, 68% and 92%. There was no statistically significant difference between the yields of the endplate-disk, disk-only, and paravertebral soft-tissue biopsies.

CONCLUSION. Paravertebral soft-tissue changes, when present, may be considered a viable target for biopsy in cases of diskitis-osteomyelitis, even in the absence of a paravertebral abscess.

Skeletal Radiology (2018) 47:1327–1335
https://doi.org/10.1007/s00256-018-3006-5

REVIEW ARTICLE

Culture yield of repeat percutaneous image-guided biopsy after a negative initial biopsy in suspected spondylodiscitis: a systematic review

Ömer Kasalak[1] · Hugo J. A. Adams[2] · Paul C. Jutte[3] · Jelle Overbosch[1] · Rudi A. J. O. Dierckx[1] · Marjan Wouthuyzen-Bakker[4] · Thomas C. Kwee[1]

Table 3 Quality assessment of the studies included using the QUADAS-2 tool [8]

Study	Risk of bias			Applicability concerns	
	Patient selection	Biopsy	Flow and timing	Patient selection	Biopsy
Ahuja and Sharma [10]	High	Low	Unclear	Unclear	Low
Terreaux et al. [11]	High	Low	Unclear	Unclear	Low
Gras et al. [12]	High	Low	Unclear	Unclear	Low
Kim et al. [13]	High	Low	Unclear	Unclear	Low
Gasbarrini et al. [14]	High	Low	Unclear	Unclear	Low
Lora-Tamayo et al. [15]	High	Low	Unclear	Unclear	Low
De Lucas et al. [16]	High	Low	Unclear	Unclear	Low
Friedman et al. [17]	Low	Unclear	Unclear	Unclear	Unclear

The following signaling questions were used to assess the risk of bias and applicability concerns (which were then scored as high risk, low risk, or unclear):

Risk of bias:

1. Patient selection. Did most patients with negative initial biopsy cultures undergo a repeat biopsy? Was it reported why patients were selected for repeat biopsy?

2. Biopsy. Could the conduct or interpretation of biopsy have introduced bias?

3. Flow and timing. Was MRI performed within 2 months before tissue biopsy? Was the repeat biopsy performed within 1 month of the initial biopsy and was no therapy administered between the initial and repeat biopsies?

Applicability concerns:

4. Patient selection. Were patients with a previous history of spondylodiscitis excluded? Were patients with positive blood cultures before biopsy excluded? Was MRI performed before biopsy and were the criteria for positivity reported? Which patients underwent a repeat biopsy after a negative initial biopsy?

5. Biopsy. Was fluoroscopic or CT guidance used? What needle size was used? How many biopsy samples were acquired?

2ª Punción en OM vertebral

- Se recomienda realizar una nueva biopsia cuando la primera no sea concluyente, pero persista la sospecha clínica o en las pruebas de imagen de OVN y la identificación del organismo en sí pudiera modificar el tratamiento.
- Siempre que no exista una necesidad urgente de intervención quirúrgica debido a una sepsis o a un deterioro neurológico.



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