



CTE 4

Technologists Committee + Inflammation & Infection Committee

Monday, October 19, 09:45–11:15

Session Title

Inflammation & Infection – Imaging of Foreign Body Associated Inflammation and Infection: Pearls and Pitfalls

Chairpersons

Tania Oliveira Hackl (Vienna, Austria)

Olivier Gheysens (Brussels, Belgium)

Programme

- 09:45–10:10 **Marta Oliveira** (Porto, Portugal): SPECT/CT: Following the Infection and Inflammation Trail
- 10:10–10:35 **Mónica Casanova Martins** (Swansea, United Kingdom): Imaging the Fire: PET/CT Applications in Inflammatory and Infection States
- 10:35–11:00 **Giuseppe Roberto Bonfitto** (Milan, Italy): Pathogen-Targeted Imaging: What's Next?
- 11:00–11:15 Q&A and Discussion

Educational Objectives

1. Provide the definition of inflammation of unknown origin and the most common aetiologies.
2. Outline the diagnostic algorithm and management of patients with inflammatory syndromes and inflammation of unknown origin.
3. Review different radiopharmaceuticals used clinically to evaluate infections.
4. Outline the impact of SPECT/CT and PET/CT techniques, including protocols and interpretation for diverse conditions such as bone infections (osteomyelitis), cardiovascular infections, fever of unknown origin, and soft-tissue infections.
5. Explain the advantages of localisation and correlation with anatomy.
6. Recognise emerging tracers for specific pathogens.
7. Describe imaging options for monitoring response to therapy.

Summary

Infectious and inflammatory diseases represent a global challenge. Delayed diagnosis and treatment lead to disabilities and impairment of quality of life. Identifying the source of inflammation and infection and choosing the right diagnostic and therapeutic strategies can be challenging but critical.

Nuclear medicine modalities can play a role in helping clinicians evaluate for occult or suspected sites of infection, using a variety of radiopharmaceuticals when structural imaging modalities such as radiography, sonography, CT, and MRI do not yield sufficient diagnostic information. Advances in camera technologies with the wider use of hybrid imaging devices such as SPECT/CT, PET/CT, and the less commonly available PET/MR are essential to provide added value and the highest sensitivity, specificity, and accuracy in diagnosing infection. Hybrid imaging offers unique insights into infection and inflammation; however, the complexity and often unpredictable outcomes require expertise and a strong interdisciplinary team to avoid misdiagnosis or missed occult infections.



The specificity of radiolabelled leucocytes for infection imaging is not ideal, yet they are considered the gold standard for the detection and localisation of many infection-associated diseases. Newer PET tracers and specific molecular agents – including radiolabelled antibodies/fragments and bacterial-specific tracers – are rapidly expanding diagnostic options. Clinical studies utilising [^{18}F]-FDS and [^{18}F]-TMP are providing more precise, non-invasive PET imaging results for distinguishing infection from inflammation.

Key Words

Inflammation; infection; Hybrid Imaging; PET/CT; SPECT/CT; Radiopharmaceuticals.