
Improved Diagnostic Accuracy for Insulinomas Using Exendin PET/CT



Insulinomas, though rare, are the most common cause of adult endogenous hyperinsulinemic hypoglycaemia (AHH). These neuroendocrine tumours arise from pancreatic β -cells and are often benign, making precise localisation essential for minimally invasive, pancreas-preserving surgeries. However, conventional imaging methods, including contrast-enhanced CT, MRI and PET/CT using somatostatin analogues, exhibit varied effectiveness in identifying insulinomas due to their small size and low receptor expression. A novel technique, Exendin PET/CT, was developed to address these limitations, targeting the glucagon-like peptide 1 receptor (GLP-1R) highly expressed in most insulinomas. A recent study's findings demonstrate the superiority of Exendin PET/CT over traditional imaging methods in terms of sensitivity, accuracy and patient comfort.

Exendin PET/CT: A Game-Changer in Insulinoma Imaging

Traditional imaging techniques, such as CT and MRI, play pivotal roles in preoperative planning for insulinoma surgeries. Despite advancements, their accuracy remains inconsistent, especially with small tumours. MRI, for instance, achieves sensitivity up to 90% but heavily depends on the tumour's size and contrast uptake. Similarly, contrast-enhanced CT offers reliable anatomical imaging but is limited in differentiating insulinomas from other pancreatic lesions.

The GLP-1 receptor presents a promising target for enhancing insulinoma detection. In Exendin PET/CT, a radiopharmaceutical labelled with Gallium-68 is used to target these receptors, providing clearer, more defined images. According to the study, Exendin PET/CT demonstrated superior sensitivity (94.4%) and provided higher insulinoma-to-background and contrast-to-noise ratios than other imaging methods. Moreover, it showed a substantial improvement in interobserver agreement, reflecting its potential to reduce diagnostic variability and enhance confidence in surgical planning.

Comparing Diagnostic Accuracy Across Modalities

The study compared Exendin PET/CT with routine imaging methods like DOTA-SSA PET/CT, contrast-enhanced CT, MRI and endoscopic ultrasound (EUS). The findings indicated that Exendin PET/CT significantly outperformed these traditional methods in sensitivity and accuracy. While DOTA-SSA PET/CT had a sensitivity of 64.2%, Exendin PET/CT achieved 94.4%. Additionally, CT and MRI, often combined to improve diagnostic accuracy, only reached around 83% in detecting insulinomas.

Endoscopic ultrasound (EUS), a more invasive procedure, demonstrated an 82.1% sensitivity. Although it remains a valuable diagnostic tool, it requires specialised expertise and patient sedation, making it less ideal as a first-line diagnostic option. Exendin PET/CT, on the other hand, offers a non-invasive and operator-independent alternative that consistently provides superior results. In fact, in 13% of cases, Exendin PET/CT was the only imaging modality capable of accurately localising insulinomas, highlighting its indispensable role in modern diagnostics.

Clinical Implications and Future Applications

The clinical implications of incorporating Exendin PET/CT into routine diagnostic protocols are substantial. By offering higher sensitivity and non-invasive imaging, Exendin PET/CT could effectively replace invasive procedures like EUS in many cases. This transition would improve patient comfort and reduce the risk of procedural complications and the overall cost of care. Additionally, the ability to accurately localise even small insulinomas aids in planning pancreas-preserving surgeries, which are crucial given the benign nature of most insulinomas.

Furthermore, using the NODAGA chelator instead of DOTA in the radiopharmaceutical formulation has reduced adverse effects like hypoglycemia, making it a safer option for patients, including children. This refinement in radiopharmaceutical has further solidified the role of

Exendin PET/CT as a reliable and patient-friendly diagnostic tool.

The study also emphasised the potential of Exendin PET/CT to be combined with contrast-enhanced CT, creating a comprehensive one-stop diagnostic solution. Such an approach would simplify the imaging workup for insulinoma patients and significantly reduce diagnostic delays, ultimately leading to more efficient and effective clinical decision-making.

Exendin PET/CT is a superior imaging modality for localising insulinomas compared to traditional methods. With its higher sensitivity, improved image quality, and reduced need for invasive procedures, Exendin PET/CT stands out as a game-changer in the diagnostic landscape. As more clinical evidence accumulates, integrating this technique into diagnostic guidelines could revolutionise patient management by reducing the complexity of the imaging workup, enhancing surgical outcomes, and improving overall patient care.

In conclusion, Exendin PET/CT combined with contrast-enhanced CT holds promise as a primary diagnostic modality for insulinomas, providing a more straightforward and more accurate imaging pathway. As the medical community recognises the advantages of this advanced imaging technique, it is likely to become the new standard for insulinoma detection and preoperative planning.

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