

ORIGINAL REPORT

Value of intraoperative ultrasound with conventional probes and its usefulness in surgical and therapeutic management of patients[☆]



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KEYWORDS

Ultrasound;
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Abstract

Objective: To prove both the reliability and the applications presented by intraoperative ultrasonography (IOUS) in surgical and therapeutic management of diverse pathologies and the possibility of doing it by using conventional equipment.

Material and methods: Single-center retrospective study of 145 IOUS performed by using conventional equipment in 135 patients between January 2011 and June 2016. We assessed the organs studied by ultrasound, underlying conditions of patients, preoperative imaging and the degree of matching them with the histological findings. The functions of the intraoperative ultrasound were assessed in each case.

Results: 91.7 per cent of the scans performed were hepatic, being other locations varied but less common. They had a high concordance with the histological results of the lesions analyzed (95.4 per cent) and in 24 per cent of the cases their results did not coincide with those of the preoperative imaging tests, being decisive for the management of the patients.

Conclusion: Despite the limitations of our study, IOUS has proven to be a reliable and safe diagnostic test with advantages over conventional imaging techniques. It contributes to get a correct diagnosis in those lesions not characterized by the preoperative imaging tests, to locate and delimit the extension of a lesion within an organ and facilitate the performance of diagnostic procedures (intraoperative biopsy) even in centers where we do not have specific probes.

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PALABRAS CLAVE

Ecografía;
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Valor de la ecografía intraoperatoria realizada con sondas convencionales y su utilidad en el manejo quirúrgico y terapéutico de los pacientes

Resumen

Objetivo: Demostrar la fiabilidad y las aplicaciones que presenta la ecografía intraoperatoria (EIO) en el manejo quirúrgico y terapéutico de diversas patologías, así como la posibilidad de utilización de equipos convencionales para su realización.

Material y métodos: Estudio retrospectivo unicéntrico de 145 EIO realizadas con equipos convencionales a 135 pacientes entre enero de 2011 y junio de 2016. Se valoraron los órganos estudiados mediante EIO, las enfermedades de base de los pacientes y las pruebas de imagen preoperatorias, y se analizó el grado de concordancia de la EIO con las mismas y con los resultados histológicos en los casos en que se obtuvo muestra de tejido, así como las funciones que desempeñó la EIO en el tratamiento de los pacientes.

Resultados: El 91,7% de las ecografías realizadas fueron hepáticas, siendo otras localizaciones variadas menos frecuentes. Estas presentaron una alta concordancia con los resultados histológicos de las lesiones analizadas (95,4%), y en el 24% de los casos sus resultados no coincidieron con los de las pruebas de imagen preoperatorias, siendo determinantes para el tratamiento de los pacientes.

Conclusión: A pesar de las limitaciones de nuestro estudio, la EIO ha demostrado ser una prueba fiable con ventajas frente a las pruebas de imagen convencionales. Ayuda a llegar a un diagnóstico en aquellas lesiones no caracterizables mediante las pruebas de imagen preoperatorias, a localizar y delimitar la extensión de una lesión dentro de un órgano, y facilita la realización de procedimientos diagnósticos (biopsia intraoperatoria) incluso en centros donde no se dispone de sondas específicas.

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Introduction

The intraoperative ultrasonography (IOUS) is a dynamic imaging modality that provides real time accurate information while performing surgical procedures.^{1,2}

Although when it was first introduced it was only limited to the study of the liver and the bile duct,^{1,3} it has progressively found more indications and today it is used in the study of any solid organs.⁴ It provides valuable information that even some times changes the therapeutic attitude to be followed with the patients.^{1,2}

It is no different from conventional ultrasound scans except for the fact that the probe is in direct contact with the surface of the organ we wish to study, which allows us to avoid the usual artifacts occurring in conventional studies.¹ So it is a rather easy imaging modality to use, although it requires a wide knowledge of the anatomy of the organ studied and special aseptic measures before performing any surgical procedures.⁴

Although there are probes specifically designed for this type of exploration,^{1,4,5} the IOUS scan may be performed using conventional units with covers for the probe and the device in order to guarantee the necessary asepsis, like we do in our center.

This procedure requires certain technical complexities and adequate planning so that the radiologist does not waste his/her time in the operating room and nothing interferes with his/her normal activity. To this end we need to know at what time during the surgery should the radiologist intervene and how much time will the radiologist put into

planning and reviewing the patient's clinical history and all prior imaging modalities.⁴

Since it is widely used in the study of different organs, we decided to show both the effectiveness and the applications of IOUS scans in the surgical and therapeutic management of different conditions.

Material and methods

We retrospectively reviewed 135 consecutive patients who underwent IOUS scans from January 2011 through June 2016.

Due to the retrospective nature of our work, we did not need the approval from the ethics committee. The necessary data were gathered by reviewing digitalized clinical histories.

The IOUS scans were performed in patients eligible for surgery with curative intent without contraindications for the intervention, and with the following indications:

- Characterization of lesions of undetermined significance due to mismatches among different preoperative imaging modalities (lesions non accessible to percutaneous biopsies).
- Identification of small sized-lesions that may be misdiagnosed using conventional imaging modalities.
- Anatomical location and determination of loco-regional or vascular invasions.
- Guidelines for the management of diagnostic (biopsy) or therapeutic (radiofrequency ablation) procedures.

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