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CORRELATION OF CT AND ULTRASOUND MORPHOMETRY OF THE ABDOMINAL WALL WITH PATHOMORPHOLOGICAL CHANGES IN POSTOPERATIVE VENTRAL HERNIAS

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Relevance

The degree of destructive changes in the musculoaponeurotic tissues of the abdominal wall is one of the most important factors influencing the immediate results of hernia repair and recurrence rates. Clinical examination and conventional radiography cannot objectively assess the anatomical and functional state of the abdominal wall, which makes it necessary to validate imaging morphometry against tissue pathomorphology.

Material and methods

A total of 131 patients were examined: a control group of 57 patients without prior laparotomy and a main group of 74 patients with postoperative ventral hernias. Ultrasound was performed in all patients and CT in 74. The thickness of the rectus muscles, total tissue density (in Hounsfield units) and structural heterogeneity were measured and compared with the morphological findings of intraoperative abdominal wall biopsies.

Results and discussion

The ultrasound and CT semiotic patterns of the normal and degeneratively changed abdominal wall correlated closely with the morphological findings. Degenerative changes — atrophy, fatty dystrophy and cicatricial deformation — were found in 45 hernia carriers (77.5%); atrophy in 51.3% and fatty dystrophy



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in 33.7%. The larger the hernia defect and the longer the duration of hernia carriage, the more pronounced the changes: muscle thinning (from a normal ≥ 10 mm to filamentous 1–2 mm structures) and a fall in total density (from 50–60 to below 20 HU) progressed in parallel and were confirmed morphologically by loss of cross-striation, a reduction in the number of muscle fibers and their replacement by connective and fatty tissue.

Conclusion

CT and ultrasound morphometry of the abdominal wall objectively reflect the pathomorphological state of the musculoaponeurotic layers in postoperative ventral hernias, with the severity of changes increasing with hernia size and duration. These methods provide a reliable, non-invasive basis for assessing the repair reserves of the abdominal wall before surgery.