

The Twelfth Rib as a Landmark for Surgery

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Abstract : Introduction: The twelfth rib is commonly used as a landmark for surgery; however, its variability in length has not been formally studied. The highly variable rib length provides a challenge for urologists seeking a consistent landmark for percutaneous nephrolithotomy and retroperitoneoscopic surgery. Methods and materials: We analysed CT scans of 100 adults who had imaging between 23rd March and twelfth April 2020 at an Australian Hospital. We measured the distance from the mid-sagittal line to the twelfth rib tip in the axial plane as a surrogate for true rib length. We also measured the distance from the twelfth rib tip to the kidney, spleen, and liver. Results: Length from the mid-sagittal line to the right twelfth rib tip varied from 46 (percentile 95%CI 40 to 57) to 136mm (percentile 95%CI 133 to 138). On the left, the distances varied from 55 (percentile 95%CI 50 to 64) to 134mm (percentile 95%CI 131 to 135). Twenty-three percent of people had an organ lying between the tip of the twelfth rib and the kidney on the right, and 11% of people had the same finding on the left. Conclusion: The twelfth rib is highly variable in its length. Similar variability was recorded in the distance from the tip to intra-abdominal organs. Due to the frequency of organs lying between the tip of the rib and the kidney, it should not be used as a landmark for accessing the kidney without prior knowledge of an individual patient's anatomy, as seen on imaging.

Keywords : PCNL, rib, anatomy, nephrolithotomy

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