Compensatory renal overgrowth after unilateral nephrectomy in children

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Aim: The aim of the study is to investigate the intensity of renal overgrowth after unilateral nephrectomy in children’s population, as well as to check dependency between kidney’s dimensions and patient’s age.

Introduction: Solitary kidney after unilateral nephrectomy tends to overgrow. In adult population the dynamic of overgrowth and maximal dimensions are identified. In childhood there are no described patterns of the process of solitary kidney overgrowth.

Methods: Patients who had undergone unilateral nephrectomy in the University Children’s Hospital of Cracow were enrolled. The length of the solitary kidney was compared with control group which was based on ultrasound examination of the kidney (left n = 1801, right n = 1635) performed in the same clinic in children without kidney disease. All examinations were carried out with Philips Epiq 5G ultrasound unit with convex probe C5-1 MHz by a single physician (PS).

The comparison was analysed with t-student test for one or two means. 18 children (7 males) from the birth to the age of 17 who underwent in total 48 ultrasound examination after the nephrectomy were enrolled.

Results: There was significant difference between the mean of the kidney’s length in patients after unilateral nephrectomy and control group. The difference was the most explicit in the groups at the age from 8 to 13 for the right kidney (difference range from 13 to 22 mm, p < 0.05) and in the groups at the age from 8 to 12 for the left kidney (difference range from 11 to 19 mm, p < 0.05). Solitary kidney in children after nephrectomy is significantly larger than in the control group.

Conclusion: The dynamic of solitary kidney overgrowth in children should be taken into consideration while performing the sonographic examination. Chronic kidney disease may be suspected when overgrowth of the solitary kidney is not present. Further research dealing with the dynamic of compensatory kidney overgrowth in children is indicated.

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