2 Resection Techniques Robotic-Assisted Partial Nephrectomy

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After dissection and control of the hilar vessels, as well as incision of the Gerota's facia, the tumour and the surrounding renal capsule is exposed [7]. Depending on the anatomy of the tumour, use of intraoperative ultrasound may be helpful. This is particularly advantageous for neoplasms with substantial endophytic growth and/or hilar location [6]. Here, robotic drop-in ultrasound probes, which are directly controlled by the console surgeon, can be used, displaying the live intraoperative images as a picture on picture display on the console screen [1, 7]. However, intraoperative ultrasound is not mandatory in the case of primarily exophytic tumours as identification is usually easily feasible.

After clear identification of the mass, the resection margins are marked with cautery. Depending on the tumour anatomy, there are several resection techniques available:

1. Resection
2. Enucleoresection
3. Enucleation.

In case of resection, the tumour is excised sharply with a rim of healthy renal parenchyma. During tumour resection, the assistant applies counter traction with the suction to ensure adequate visualization. Ideally, mainly cold scissors are used to better visualize the healthy parenchyma surrounding the tumour and to minimize the risk of positive surgical margins [6].

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In case of enucleoresection, the capsule of the kidney is incised circular about 5 mm around the tumour. A pseudocapsula of compressed healthy tissue around the tumour is found and mainly blunt dissection is done with cold scissors. At the base of the dissection, the resection is completed sharply [5].

In case of enucleation, the kidney capsule is again sharply incised close to the tumour, the pseudocapsula is found and the tumour is enucleated by blunt dissection, with no visible rim of healthy parenchyma around the tumour [4].

Recently, a prospective multicentre study described the resection technique to be an important predictor of surgical complications, early functional outcomes, as well as positive surgical margins [3]. Here, enucleation and resection showed to be superior in achieving the trifecta outcomes (no major complications, no acute kidney failure, negative surgical margins) compared to enucleoresection. However, suturing techniques for renorrhaphy were not considered in this analysis.

Since renal parenchyma preservation is one of the strongest predictors of functional outcomes following partial nephrectomy, the amount of healthy tissue excised during surgery should be carefully weighed by the surgeon's judgment based on patient and tumour characteristics [2].

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