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| **PROTOCOL TITLE:** Evaluation and Usage of Kidneys From Adult Donors with a Small Renal Mass |
| **APPLICABLE FACILITIES:**[ ] EHC [ ] EDH [ ] EHH [ ] EHI [ ] EHN [ ] EJCH [ ] ELTAC [x] ESJH[x] EUH [ ] EUHM [ ] EUHS [ ] EUOSH [ ] EWWH [ ] RJV-ERH [ ] RJV-ESOP [ ] TEC/ESA |
| **EFFECTIVE DATE:** 02/08/2021 | **ORIGINATION DATE:** 12/20/2020 |

**SCOPE:**

For utilization by i) transplant surgeons evaluating kidney offers from deceased donors with a small renal mass, ii) transplant surgeons and nephrologists evaluating potential living donors who are found to harbor a small renal mass at the time of evaluation and iii) transplant surgeons and nephrologists managing and caring for the recipients of such organs.

**PURPOSE:**

To provide criteria to ensure consistent practice when evaluating kidney offers from deceased donors with a small renal mass, potential living donors who are discovered to have a small renal mass, and when caring for recipients of such organs.

**CONTENT:**

**Policy Statement**:
The Emory Kidney Transplant Program will consider kidneys from donors with a small renal mass discovered at the time of organ procurement or during living donor evaluation. The affected kidney (as well as the contra-lateral [unaffected] kidney in the case of deceased donors) may be considered for transplantation, provided that appropriate criteria are met. In the non-transplant population, oncologic outcomes following the resection of small renal masses are excellent. Nevertheless, it is recognized that both end-stage renal disease and the post-transplant immunosuppressed state are associated with an increased incidence [and lethality] of some urologic malignancies, including renal cell carcinomas. However, a growing body of literature suggests that the transplantation kidneys from a donors with a small renal mass, after tumor excision, into appropriately selected recipients is feasible, confers a benefit similar to that of other transplanted kidneys, and is not associated with compromised oncologic outcomes in the recipient. Recent international guidelines, updated to reflect this literature, recommend against discarding a deceased donor kidney on the basis of a small renal mass alone (Breda et al. 2019). For the purposes of this document, a small renal mass will be defined as a well circumscribed, organ-confined, solid or cystic mass measuring **≤ 4 cm** (T1a).

**General Outcomes and Risks**

* **Cancer Recurrence & Survival**

A recent review (Cristea et al. 2020) evaluated the transplantation of

147 tumorectomized kidneys (120 RCC)

– Follow-up (mean): 44.2 months

– Recurrence: one at 9 years post-transplantation (managed with active surveillance)

27 contra-lateral kidneys (25 RCC)

– Follow-up (mean): 46.7 months

– Recurrence: 1 from a kidney with tubulo-papillary adenoma at 4 months

 (underwent curative allograft nephrectomy)

 Overall recurrence rate: **1.4%**

One year graft survival: **95%** (data from 129 tumorectomized kidneys)

Hevia et al. (2019) evaluated a subgroup of 109 tumorectomized kidneys with a mean follow-up of 39.9 months and found overall and graft survival rates of >95% at 1 and 3 years.

* **Surgical Complications**

Surgical complications were reported for 112 of the aforementioned 147 tumorectomized kidneys

 – 5 urine leaks – managed conservatively (4.8%)

 – 2 re-explorations for hematoma (1.8%)

 – 2 AVM/pseudoaneurysms – managed with angioembolization (1.8%)

**Eligible Recipients**

Kidneys from ***deceased donors*** with a small renal mass will be considered at the discretion of the transplanting surgeon. Recipient factors that may be considered are the following:

* Age
* 0-ABDR mismatch
* Degree of sensitization
* Dialysis access issues

Patients should be counseled at the time of organ offer and consent should be documented in chart by the attending surgeon.

Kidneys from ***living donors*** with a small renal mass may be considered for the intended recipient, provided appropriate criteria are met in the evaluation of the living donor (see below).

**Evaluation of Deceased Donors**

* Donors should undergo a thorough inspection of abdominal and thoracic cavities to rule out the presence of metastatic disease
* Pre-operative abdominal imaging should be carefully reviewed; if there are multiple renal lesions discovered, the kidneys ***should not*** be used for transplantation (exception: simple cysts, confirmed benign tumors)
* If pre-operative imaging is not available, the contra-lateral kidney can be evaluated using bench-side ultrasound at the discretion of the transplanting surgeon
* The tumor should be excised in its entirety without being violated. If possible, the kidney should be accepted with biopsy waivers and resected by the transplanting surgeon
	+ If the tumor is biopsied by the OPO, the receiving surgeon should ensure that the biopsy involved a complete resection of the lesion

**Evaluation of Living Donors**

* Living donors who are found to harbor a small renal mass at the time of evaluation may still be candidates for kidney donation, but should first be referred to Urology for a full evaluation and discussion of treatment options, independent of any considerations to donate

**Tumor Excision and Reconstruction**

* Tumors can be excised with a 1 cm margin or enucleated – this should be done by the transplanting surgeon and entry into the tumor should be avoided
* Frozen section biopsy may be performed at the discretion of the transplanting surgeon to confirm diagnosis, rule out adverse pathology, and establish negative margins; however, the utility of frozen section for this purposes is likely to be limited
* The resection site may be closed according to surgeon preference

**Post-Operative Care of The Recipient**

* **Immunosuppression**

– In the aforementioned literature, a minority of recipients (34) received mTOR based immunosuppression, due to its known anti-neoplastic properties and use as treatment for RCC

– There is insufficient evidence to recommend mTOR immunosuppression as a default and all recipients should therefore undergo standard immunosuppression with Tac 1.5 or Bela 2.7 protocols, as appropriate

* **Follow-up Schedule**

In addition to standard transplant laboratory follow-up, all recipients should be closely monitored for tumor recurrence. Laboratory investigations should always include CBC, CMP, LFTs, ALP, and serum Calcium.

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| **Time Frame Post Transplantation** | **Suggested Investigations** |
| 0-2 years | Laboratory investigations every 6 monthsChest x-ray every 6 monthsAbdominal USa every 6 months |
| 2-5 years | Laboratory investigations every 12 monthsChest x-ray every 12 monthsAbdominal USa every 12 months |

aFollow-up with CT/MRI if questionable findings or substitute US for CT/MRI in cases of high grade tumor (G3-4) or adverse pathology with rare/aggressive subtype of RCC (eg. medullary, rhabdoid, sarcomatoid, collecting duct).

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**KEY WORDS:**

Renal Cell Carcinoma

Small Renal Mass

Partial Nephrectomy