



ROLE OF PRE-OPERATIVE TRANSARTERIAL RENAL ANGIOEMBOLISATION IN LOCALLY ADVANCED AND METASTATIC RCC TO IMPROVE SURGICAL OUTCOME

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ABSTRACT The standard of care for most renal malignancies has been surgical , be it radical nephrectomy for non-metastatic RCC or cyto-reductive nephrectomy for metastatic RCC before immunotherapy to avoid immunological sink phenomenon. But unfortunately many patients with RCC present with advanced disease with heavy local tumor burden. Hence a technique to improve tumour resectability such as renal artery embolization was adopted which proved useful in our study.

KEYWORDS : Chromosomal abnormality, Bad obstetric history, genetic counseling.

STUDY DESIGN:

- RETROSPECTIVE COMPARATIVE S
- STUDY PERIOD – January 2016 – January 2019

MATERIALS AND METHODS

Inclusion criteria for RN in locally advanced RCC:

- 1. Patients with tumour size more than 10 cm © T2b),
- 2. hilar location of tumours,
- 3. tumours abutting adjacent organs cT4 and vascular structures but not gross invasion
- 4. Patients with Good and Intermediate prognostic factors

EXCLUSION criteria

1. Liver and brain metastasis
2. Palliative renal angioembolisation for metastatic RCC.
3. Patients with poor surgical risk

METHOD OF STUDY :

A retrospective data on the total number of patients who underwent cyto-reductive nephrectomy for metastatic RCC and radical nephrectomy for locally advanced RCC abutting adjacent organs but without gross infiltration, more than 10 cm T size, hilar tumours over the past 3 years for both cyto-reductive and radical nephrectomy where chosen. The patients were grouped into those who did not undergo pre-operative selective renal artery angioembolisation as group A and those who underwent selective RAE with gel foam and PVC beads 24-48 hours prior to surgery as group B.

The surgical outcome of both these groups were compared in terms of

- Resectability
- operative time ,
- intra operative blood loss and

other complications such as injury to adjacent structures.

To overcome self-selection bias all the surgeries done by a single surgeon were chosen. The data was statistically analysed using student-t test. All the patients underwent nephrectomy by traditional open transcostal extra peritoneal approach.

RESULTS AND OBSERVATION :

There were 13 patients in the cyto-reductive nephrectomy and 11 patients in the radical nephrectomy group. 7 patients in the cyto-reductive group and 6 patients in radical nephrectomy group had selective angioembolisation done.

1. BLOOD LOSS :

The mean blood loss in post RAE CN group was 333.57 ml and 325 ml in post RAE RN group.

The mean blood loss in group without RAE CN group was 618.33 ml and 619 ml in RN group.

There was 46 % more blood loss in CN 47.49 % in RN group without RAE (p<0.05).

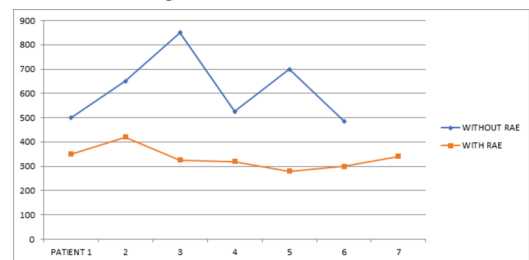
BLOOD TRANSFUSION RATE :

Blood transfusion rate was 0.55 in postRAE CN group and 0.5 in RN group versus 1.75 and 2.0 in CN and RN groups without RAE respectively.

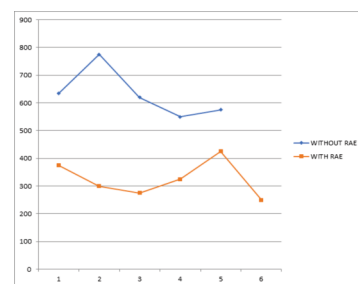
2. RESECTABILITY:

021 In post RAE group, in 6 out of 7 patients undergoing CN , resection was successful with a percentage of 85.7 % and in RN group 5 out of 6 patients resection was successful with a percentage of 83.33 %.

- In 1 patient in RN group resection was not possible due to infiltration of 2 nd part of duodenum which was not obvious on CT.



Blood loss in RN group



Blood loss in RN group.

In 1 patient in CN group resection was precluded due to aorta wall infiltration.

- In patients without RAE the tumor was resectable in 3 out of 6 patients in CN group and 3 patients out of 5 in RN group.

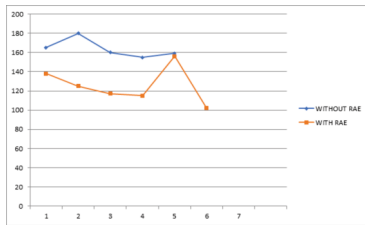
OPERATIVE TIME:

The mean operative time in post RAE CN group was 123.85 min and 126 min in post RAE RN group versus 171 in CN and 163.8 in RN group without RAE (p<0.05).

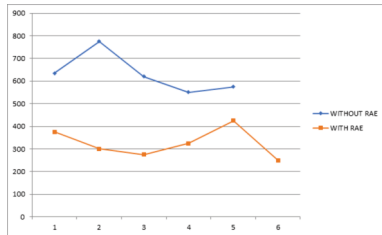
INTRA-OPERATIVE COMPLICATIONS:

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- In cases without RAE there was 1 case of IVC and 1 case of colonic injury in CN group and 1 case of IVC injury in RN group. All these cases were right sided tumours.

While in the post RAE group there were no cases of adjacent organ injury in both RN and CN groups.



OPERATIVE TIME IN CN



OPERATIVE TIME IN RN

Follow-up:

The patients were followed up for 1-3 years and 3 patients with metastatic RCC died overall due to disease progression after 1 year of surgery.

CONCLUSION :

- Renal artery angioembolisation is useful in
- 1.reducing intra-operative blood loss,
- 2.providing better resectability rates
- 3.reduced operative time
- 4.transfusion rates and
- 5.lesser perioperative morbidity

in patients undergoing cytoreductive nephrectomy for metastatic RCC and radical Nephrectomy for locally advanced RCC. Hence the procedure can be tried in select settings. Also the procedure has to be planned in less than 24-48 hours before surgery to avoid post embolization syndrome.

LIMITATIONS OF THE STUDY :

It's a retrospective study and randomization will provide better results. The sample space is limited due to case selection and rarity of such large tumour in the era of non-invasive imaging.

REFERENCES

1. Valsechi MC, Oliveira AB, Conceição AL, Stужи B, Candido NM, et al. (2014) GPC3 reduces cell proliferation in renal carcinoma cell lines. *BMC Cancer* 14: 631-644.
2. Psutka SP, Leibovich BC (2015) Management of inferior vena cava tumor thrombus in locally advanced renal cell carcinoma. *Ther Adv Urol* 7: 216-229.
3. Rendon RA, Kapoor A, Breau R, Leveridge M, Feifer A, et al. (2014) Surgical management of renal cell carcinoma: Canadian Kidney Cancer Forum Consensus. *Can Urol Assoc J* 8: 398-412.
4. Almgard LE, Fernstrom I, Haverling M, Ljungqvist A (1973) Treatment of renal adenocarcinoma by embolic occlusion of the renal circulation. *Br J Urol* 45: 474-479.
5. R Loffroy, Rao P, Ota S, Geschwind JF (2010) Renal artery embolisation prior to radical nephrectomy for renal cell carcinoma: when, how and why? *Br J Radiol* 83: 630.
6. Reinhart HA, Ghaleb M, Davis BR (2015) Transarterial embolization of renal tumors improves surgical outcomes: A case series. *Int J Surg Case Rep* 15:116-118.
7. Kawamoto S, Solomon SB, Bluemke DA, Fishman EK (2009) CT and MR Imaging Appearance of Renal Neoplasms after Radiofrequency Ablation and Cryoablation. *Semin Ultrasound CT MR* 30: 67-77.
8. Prasad SR, Humphrey PA, Catena JR, Narra VR, Strigley JR, et al. (2006) Common and uncommon histologic subtypes of renal cell carcinoma: imaging spectrum with pathologic correlation. *Radiographics* 26: 1795-1806.
9. Hollingsworth JM, Miller DC, Daignault S, Hollenbeck BK (2006) Rising incidence of small renal masses: a need to reassess treatment effect. *J Natl Cancer Inst* 98: 1331-1334.
10. Cho IC, Chung J (2012) Current Status of Targeted Therapy for Advanced Renal Cell Carcinoma. *Korean J Urol* 53: 217-228.
11. Crispin PL, Breau RH, Allmer C, Lohse CM, Chevile JC, et al. (2011) Lymph node dissection at the time of radical nephrectomy for high-risk clear cell renal carcinoma: indications and recommendations for surgical templates.
12. David Li, Pua BB, Madoff DC (2014) Role of Embolization in the Treatment of Renal Masses. *Semin Intervent Radiol* 31: 70-81.
13. Steven S, Zuckerman DA (2011) Renal Artery Embolization. *Semin Intervent Radiol* 28: 396-406.
14. Pari V, Pandharipande PV, Gervais DA, Hartman RI, Harisinghani MG, et al. (2010) Renal Mass Biopsy to Guide Treatment Decisions for Small Incidental Renal Tumors: A Cost-effectiveness Analysis. *Radiology* 256: 836-846.
15. Leveridge MJ, Finelli A, Kachura JR, Evans A, Chung H, et al. Outcomes of small renal mass needle core biopsy, nondiagnostic percutaneous biopsy, and the role of repeat biopsy. *Eur Urol* 60: 578-584.
16. Tomaszewski JJ, Uzzo RG, Smaldone MC (2014) Heterogeneity and renal mass biopsy: a review of its role and reliability. *Cancer Biol Med* 11: 162-172.
17. Schwartz MJ, Smith EB, Trost DW, Vaughan ED Jr (2007) Renal artery embolization: clinical indications and experience from over 100 cases. *Upper Urinary Tract* 99: 881-886.

18. Zielinski H, Szmigielski S, Petrovich Z (2000) Comparison of preoperative embolization followed by radical nephrectomy with radical nephrectomy alone for renal cell carcinoma. *Am J Clin Oncol* 23: 6-12.
19. Zargar H, Addison B, McCall J, Bartlett A, Buckley B, et al. (2014) Renal artery embolization prior to nephrectomy for locally advanced renal cell carcinoma. *ANZ J Surg* 84: 564-567.
20. Craven WM, Redmond PL, Kumpe DA, Durham JD, Wettlaufer JN, et al. (1991) Planned delayed nephrectomy after ethanol embolization of renal carcinoma. *J Urol* 146: 704-708.
21. Lin PH, Terramani TT, Bush RL, Keane TE, Moore RG, et al. (2003) Concomitant intraoperative renal artery embolization and resection of complex renal carcinoma. *J Vasc Surg* 38: 446-450.
22. Baum S, Pentecost MJ (2005) *Abrams Angiography: Interventional Radiology*. (2nd ed).
23. Richardson AJ, Laurence JM, Lam VW (2013) Transarterial chemoembolization with irinotecan beads in the treatment of colorectal liver metastases: systematic review. *J Vasc Interv Radiol* 24: 1209-1217.
24. Kogut MJ, Chewning RH, Harris WP, Hippe DS, Padia SA, et al. (2013) Postembolization syndrome after hepatic transarterial chemoembolization: effect of prophylactic steroids on postprocedure medication requirements. *J Vasc Interv Radiol* 24: 326-331.
25. May M, Brookman-Amissah S, Pflanz S, Roigas J, Hoshcke B, et al. (2009) Pre-operative renal arterial embolisation does not provide survival benefit in patients with radical nephrectomy for renal cell carcinoma. *Br J Radiol* 82: 724-731.
26. Zielinski H, Szmigielski S, Petrovich Z (2000) Comparison of preoperative embolization followed by radical nephrectomy with radical nephrectomy alone for renal cell carcinoma. *Am J Clin Oncol* 23: 6-12.
27. May M, Brookman-Amissah S, Pflanz S, Roigas J, Hoshcke B, et al. (2009) Pre-operative renal arterial embolisation does not provide survival benefit in patients with radical nephrectomy for renal cell carcinoma. *Br J Radiol* 82: 724-731.
28. Lin PH, Terramani TT, Bush RL, Keane TE, Moore RG, et al. (2003) Concomitant intraoperative renal artery embolization and resection of complex renal carcinoma. *J Vasc Surg* 38: 446-450.
29. Rodriguez Carvajal R, Orgaz A, Leal JJ, Peinado FJ, Vicente S, et al. (2011) Renal embolization and nephrectomy in a single surgical act in high-risk renal tumor pathology. *Ann Vasc Surg* 25: 222-228.