ENDOVASCULAR TREATMENT OF HEMORRHAGIC COMPLICATIONS IN PERCUTANEOUS RENAL SURGERY: CASE REPORTS AND LITERATURE REVIEW

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Disclosure

Speaker name:

MARCELO FRANCHINI GIUSTI, MD.

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

☒ I do not have any potential conflict of interest
• Renal percutaneous procedures surgical are safe and effective

• Hematuria is the most common complication - 0.8% to 7.6% in nephrolithotomy

• Large or persistent hemorrhages require invasive approach

INTRODUCTION

Jinga et al., Chirurgia (Bucur). 2013
El-Nahas et al., J Urol. 2007
Uflacker et al., et al., J Urol. 1984
Richstone et al., J Endourol 2008
Selective renal embolisation is a highly resolutive option for the treatment of iatrogenic hematuria, with low complication rates and considerable preservation of renal tissue.

NOW – Gold Standard for Treatment of hemorrhages percutaneous renal surgical techniques complications
TECHNICAL

INDICATIONS

• Massive hematuria
• Rapid drop in hematimetric parameters
• Need for transfusion of 3 or more concentrates of red blood cells
• Rapid increase in perirenal hematoma
• Single kidney (anatomic or functional)
• Detection of extravasation of the contrast or suggestive of aneurysm, pseudoaneurysm, arteriovenous or arteriocalceal fistulas;
• Failure to interrupt haematuria with nephrostomy clamping and / or with tampon balloon.
CONTRAINDICATIONS:

- Severe atherosclerotic alterations of the renal arteries
- Renal insufficiency
- Severe peripheral arterial disease (which could compromise arterial access)
- Allergy to iodinated contrast agents
DIAGNOSIS:

- Hematuria (postoperative or history suggestive of trauma)

- **Angiography** - Gold Standard of Diagnosis and Specific Treatment

- Other modalities
  - Angio-CT
  - Ultrasonography
  - Laboratorial exams

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Fischer et al., AJR Am J Roentgenol 1989
Corr et al., Clin Radiol 1991
Cantasdemir et al., Clin Radiol. 2003
Rokni et al., J Urol. 2008
Sullivan et al., et al., J Ultrasound Med 1991
CASE 1
CASE REPORT

- Male, post-nephrolithotomy
- Persistent hematuria

- Angio-CT
- Superselective coil embolisation

Gently provided by Covidien / Brazil
CASE 2
CASE REPORT

- Female, post-biopsy
- Persistent hematuria
- Angiography
- Superselective coil embolisation
CASE 3
CASE REPORT

- Male, post-nephrolithotomy
- Persistent hematuria

- Angiography
- Superselective coil embolisation
Selective renal embolisation stands as the first choice treatment for iatrogenic hematuria with satisfactory results (>95% bleeding control), low rates of recurrence and complications.

<table>
<thead>
<tr>
<th>Author/ Year</th>
<th>N</th>
<th>Technical success</th>
<th>Clinical Success</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guo et al. / 2017</td>
<td>27</td>
<td>100%</td>
<td>96.3%</td>
<td>Gross hematuria - second embolisation</td>
</tr>
<tr>
<td>Chiramel et al. / 2009</td>
<td>53</td>
<td>94.3%</td>
<td>71.7%</td>
<td>Only coil embolisation. Need second approach</td>
</tr>
<tr>
<td>Ierardi et al. / 2014</td>
<td>21</td>
<td>100%</td>
<td>95%</td>
<td>Analyzed only biopsies.</td>
</tr>
<tr>
<td>Schwartz et al. / 2007</td>
<td>121</td>
<td>100%</td>
<td>-</td>
<td>Emphasis on preoperative RAE of renal tumors</td>
</tr>
</tbody>
</table>
DISCUSSION

- Intervention for hematuria is rare (1.4%)
- Pseudoaneurysms and AV Fistulae may have delayed presentation
DISCUSSION

- **Materials**
  - Coils are the most used devices – capillaries 100-200 µm
  - Calibrated microspheres
  - PVA microparticles (polyvinylalcohol)
  - Liquid agents / polymers
  - Balloons and stents – Surgical bleeding

- **Angiography**
  - Complete abdominal aortography
  - Lumbar arteries and the iliac system
  - Selective renal angiography
  - Nephrogram - drainage renal venous
DISCUSSION

➢ **Technical success**
  - Complete cessation of active bleeding or absence of recurrent hematuria
  - Absence of extravasation
  - Elimination of the need for further embolization or subsequent renal surgery
  - Total occlusion of the feeding vessels the lesion

➢ **Treatment failure**
  - Failure to identify multiple lesions
  - Large and high-flow fistulae
  - Major renal arterial trunk lesions

Sayani et al., *J Pak Med Assoc.* 2012  
Complications

- Puncture site: bleeding and hematoma
- Arterial dissection
- Renal and perirenal abscesses
- Contrast induced-nephropathy

Renal parenchyma ischemia

- 20% at the embolisation
- Remains only 5% after 6 months

Renal function

- Return to base levels after embolisation
Percutaneous embolization of iatrogenic lesions of the renal arteries and their branches is an effective and minimally invasive procedure, with high success rates in experienced centers, providing immediate benefits, including reduction of patients morbi-mortality and shortened hospital stay.
Thank you !!! Danke schön!!! Obrigado!!!
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