ROYAL COLLEGE
OF PHYSICIANS AND SURGEONS OF CANADA
COLLÈGE ROYAL
DES MÉDECINS ET CHIRURGIENS DU CANADA

Sample Applied Exam – Urology

Case 1

A 68-year-old man is referred to your clinic with a history of one episode of painless gross hematuria. He has no other lower urinary tract symptoms. He has a history of controlled hypertension and dyslipidemia. Urinalysis and urine cultures did not show any evidence of a urinary tract infection. Laboratory evaluations are within normal limits. Serum creatinine level is 80 µmol/L with an eGFR of 90 mL/min.

Question 1

The history and physical are otherwise non-contributory. What diagnostic tests would you use to evaluate this patient?

MODEL ANSWER

- Urine cytology
- Cystoscopy*
- Upper tract axial imaging* (CT urogram preferred, MR urogram acceptable, ultrasound not acceptable)

**deficient if candidate does not recommend cystoscopy and upper tract imaging*

Question 2

Cystoscopy revealed a solitary 2-cm sessile lesion on the posterior wall of the bladder. Ureteric orifices were not involved. Urine cytology was positive for high grade urothelial carcinoma. CT urogram shows a soft tissue high attenuation mass in the bladder.

What further information would you like to know about the CT imaging?

MODEL ANSWER

- Location of tumor
- Local extent of disease
- Presence of hydronephrosis
- Presence and location of enlarged lymph nodes
- Presence of visceral or bony metastases
- Upper tract filling defects
- Cortical renal tumours

Question 3

The CT scan shows a mass without evidence of extravesical extension. There is no hydronephrosis, no lymphadenopathy, and no visceral or bony metastases. How would you proceed now?

MODEL ANSWER

- TURBT with examination under anesthesia
- CT scan chest
- Staging bloodwork (typically includes CBC, electrolytes, creatinine/eGFR, calcium, coagulation profile [PTT, PT/INR] and LFTs (AST, ALT, ALP, GGT, LDH, bilirubin)

Intermediate-risk primary, solitary, and small (<3 cm) HG Ta should be considered and treated as high-risk patient. The need of single immediate postoperative instillation is therefore no longer required.Question 4

a) Discuss the rationale for the immediate administration of a single dose of intravesical chemotherapy.

MODEL ANSWER

- Immediate single instillation of chemotherapy post-TURBT should be offered to all patients with presumed low-risk NMIBC, is recommended for low-intermediate-risk (0 factors), intermediate-risk (1-2 factors) NMIBC and should be discussed even when further adjuvant intravesical chemotherapy is planned.Reduces recurrence (not progression) particularly for the initial presentation of a solitary papillary low-grade tumor

b) What drugs may be used for intravesical chemotherapy in the immediate postoperative setting?

MODEL ANSWER

- Mitomycin C
- Epirubicin
- Immediate single instillation of chemotherapy post-TURBT = MMC, epirubicin, doxorubicin, pirarubicin, or gemcitabine

c) What potential side effects of mitomycin C should be discussed with any patient being considered for intravesical mitomycin C instillation?

MODEL ANSWER

- Local irritative symptoms (frequency, urgency, dysuria, abdominal cramps, diarrhea, etc.)
- Cystitis (chemical or bacterial)
- Cutaneous desquamation
- Decreased bladder capacity (due to contractures)
- Calcified eschars
- Added difficulty of subsequent cystectomy
- Chemical peritonitis (if given post-perforation)
- Bone marrow suppression/leukopenia/thrombocytopenia/anemia (if given post-perforation or with hemorrhagic large tumour resection site)

Question 5

The patient undergoes an uneventful transurethral resection of bladder tumour (TURBT) procedure. What are the key components of an adequate TURBT pathology report?

MODEL ANSWER

- Histology, including CIS and variants
- Stage

- Grade
- Presence of muscularis propria in specimen
- Presence of lymphovascular invasion

Question 6

Pathology demonstrates the presence of high grade urothelial carcinoma with invasion of the lamina propria. Muscle was present in the sample but was uninvolved. There is associated carcinoma in situ (CIS) with lymphovascular invasion. What are the management options at this point?

MODEL ANSWER
- Repeat TURBT
- Immediate cystectomy

Question 7

Explain the rationale for repeat TURBT in this patient.

MODEL ANSWER
- Improve staging/assess for upstaging (20%) even in the presence of muscle in the sample
- Eradicate residual urothelial carcinoma
- Decrease recurrence
- Improve response to BCG
- More accurate prognostication (if residual HGT1 disease is present, chances of progression at 5 years is approximately 80%)

Question 8

A second TURBT is performed 4 weeks later revealing no residual disease with adequate muscularis propria present in the sample. The patient declines cystectomy and wishes to preserve his bladder. How would you proceed and why?

MODEL ANSWER
- Induction intravesical BCG with maintenance
- Intravesical BCG is the ONLY intravesical therapy that delays tumour progression and recurrence in randomized clinical trials and this patient is at high risk for tumour progression

Question 9

The patient elects to undergo intravesical therapy with induction and maintenance BCG. Follow-up surveillance examinations of the bladder by cystoscopy reveal a complete response at 3 months with normal urine cytology. The patient elects to stop additional maintenance doses of BCG at 1 year. Subsequent cystoscopic examinations remain normal, but urine cytology is positive for high grade urothelial carcinoma at 18 months. How would you proceed?

MODEL ANSWER
- Upper tract imaging (CT urogram)*
- Repeat staging (CT Chest, staging bloodwork)

- (not cystectomy)**

**deficient if candidate does not recommend upper tract imaging*
***deficient if candidate recommends cystectomy*
Note: If imaging negative, random bladder and prostatic urethral biopsies Fluorescent cystoscopy/photodynamic diagnosis is an alternative to random biopsies.

Question 10

His eGFR remains normal and a CT urogram is performed. Discuss the pertinent findings.

(Examiner will show illustrations 1 and 2)

MODEL ANSWER
- 1 cm soft tissue mass/filling defect left lower pole calices
- No regional lymphadenopathy
- No hydronephrosis
- Normal contralateral kidney
- No evidence of metastatic disease in selected images (liver, lung bases, bones)

Question 11

What is the working diagnosis?

MODEL ANSWER
- Left upper tract urothelial carcinoma

**deficient if candidate does not provide correct working diagnosis*

Question 12

a) You suspect upper urinary tract urothelial carcinoma. Discuss the role of diagnostic ureteroscopy in further assessment of this finding, and provide your recommendation regarding ureteroscopy in this patient.

MODEL ANSWER
- Ureteroscopy with biopsy may allow for accurate grading of the lesion
- Staging is difficult, problematic and correlates poorly with pathologic staging
- There remains a risk of extravasation, seeding and dissemination, albeit low
- Useful when diagnosis remains in question after conventional imaging
- Useful in those in whom the treatment plan may be modified on the basis of the ureteroscopic findings

Note: either diagnostic URS or not doing URS is acceptable

b) In this case, you perform diagnostic ureteroscopy, and the pathology report confirms a high grade urothelial carcinoma. What is your NEXT step in management?

MODEL ANSWER
- Left nephroureterectomy + resection of bladder cuff +/- regional lymph node dissection*
- Consideration of neoadjuvant chemotherapy, rationale is extrapolation from MIBC
- Consideration of enrollment into clinical trial

- (not endoscopic resection or BCG instillation)**

**Exemplary if resident adds adjuvant chemo as per POUT trial*
***deficient if candidate recommends endoscopic resection or BCG instillation*

Question 13

Discuss the role of lymphadenectomy in the clinically nonmetastatic patient with upper urinary tract high grade urothelial carcinoma undergoing nephroureterectomy.

MODEL ANSWER

- Role and extent remains under debate
  - Extrapolation from bladder
  - May aid decision for subsequent chemotherapy
- Potential prognostic benefit
- No therapeutic benefit shown
- Patients with pN0 disease have superior oncologic outcomes compared to those with pNx
- Patients with pN+ disease have inferior outcomes compared with those with pNx

Question 14

The patient elects to undergo a nephroureterectomy with regional lymphadenectomy. Final pathology is consistent with pT3aN0high grade urothelial carcinoma with lymphovascular invasion and negative margins. Discuss the role of systemic chemotherapy in both the neoadjuvant and adjuvant setting.

MODEL ANSWER

- Chemotherapy is cisplatin-based ideally (POUT trial accepted carboplatin substitution for adjuvant chemotherapy)
- Neoadjuvant data principally extracted from trials in bladder cancer
- Consider neoadjuvant chemotherapy in high grade non-metastatic upper tract urothelial carcinoma when renal function is optimal.
- POUT trial evidence supports use of adjuvant chemotherapy
- (improved disease-free survival – 15% absolute difference b/w adjuvant chemo and surveillance) Exemplary