Approach to the Residual Postchemotherapy Mass

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High Stage Disease

- Surgery for seminoma
- Selection for PC RPLND-nonseminoma
- Templates for low volume and high volume tumor

Post chemotherapy seminoma

- MSK: greater than 3 cm diameter
- IU: observe everyone; operate for progression
- No teratoma associated with pure seminoma so PET scan might distinguish between fibrosis and cancer

PET/Seminoma

IUJCO 17:3457, 1999

- 29 patients with seminoma and residual tumor post chemotherapy
- 19 had primary chemo, 14 of which were > 3cm; all had negative PET and none progressed at mean 11.5 months
- 10 had salvage, 4 of which were > 3cm. One had positive PET, but neg path in MS; this patient recurred in RP
- Most had PETs < 2 months after completion of chemotherapy
**SEMPET Trial**  
DeSantis, et al, JCO 22:1034, 2004

- Multicenter, 51 seminoma patients (56 scans) after chemotherapy  
- PETS performed 4-12 weeks post chemo  
- All 19 with > 3cm masses were correctly predicted by PET; 35 of 37 < 3 cm were correctly predicted  
- PPV 100%; NPV 96%  
- Sounds pretty good

**Morbidity of Seminoma Resection**  

- 97 PC patients with seminoma elements  
- 38% required additional intraop procedures  
- 24% complication in the seminoma group  
- 20% complication in the nonseminoma group  
- When indicated, seminoma resection is technically feasible and associated with acceptable morbidity

**IU experience with seminoma PC**  
JCO 24:e54, 12/1/06

- Retrospective 24 patients study  
- All PETs done > 2 mo after chemotherapy  
- 14 PETs after primary chemo; 10 after salvage  
- 12 PETs read as neg; no relapses (med f/u 29 mo)  
- 12 PETs read as pos; 8 really had persistent cancer, 4 did not (2 > 3 cm, 2 < 3 cm)
PET

- This patient had a completely negative PET performed 2 months after completion of chemotherapy
- We did his surgery since he did not experience a significant size reduction
- He had 25% seminoma in the specimen
- We defer to clinical judgement in post chemo seminoma

PC RPLND selection

- Normal markers and persistent RP mass
- Failure of chemotherapy (elevated markers) and localized tumor
- Some advocate PC RPLND with normal markers, normal CT (15-20% finding of teratoma or cancer in specimen)
- We observe cCRs and < 5% recur
PC RPLND
appropriate templates

- Previously, low volume stage II tumor was treated with primary RPLND to attempt reduction of exposure to chemotherapy
- With declining acute morbidity of chemotherapy, low volume stage II tumor is now commonly treated with BEP x 3 or EP x 4

Selection for RPLND
MSK, JCO23: 2781, 2005

- Primary RPLND restricted to normal postorch markers, CS I to IIA, and “stable RP disease between renal vessels and iliac bifurcation”
- This is a mirror of private practice in which low volume RP tumor is usually treated with chemotherapy
- Hence, a lot of low volume stage II tumor is now treated with chemotherapy primarily
- Some of these patients will have residual RP masses
Technical Considerations

- Incision
- Vascular isolation
- Lumbar division and control
- Resection from body wall
- Vascular replacement
- Post chemotherapy nerve sparing

Incision

- Midline - most common
- Thoracoabdominal - rarely used currently
- Midline/thoracotomy - usually staged unless known teratoma
- Supra 11th approach to retrocrural area

Retroperitoneal Exposure

- Usual approach is to incise from Foramen of Winslow to IMV-splenic vein junction, then divide IMV
- After this, IMA is divided, giving exposure to left side of retroperitoneum
- Alternative approach for left side only is to mobilize the left colon
Vascular Isolation

- Described by Donohue as “split and roll”
- Conceptually, it is the mobilization of relevant vascular structures away from tumor, followed by resection of tumor from body wall
- Is applicable to other types of urologic surgery
Lumbar Division

- This allows the mobilization of aorta and cava
- It is difficult to convince residents that this is something they need to learn; however, when they have learned it, they are glad they have it in their arsenal of techniques
Ureteral Mobilization/Crus Exposure

- Ureteral mobilization defines the lateral boundaries
- Crus exposure defines the superior extent
- Over the years we have had to use ileal ureters on a few patients who were dependent upon mid aortic arteries to supply the ureter
- Sometimes the ureter is very adherent to the retroperitoneal tumor
**Modified PC RPLND**

- 1991-2004 retrospective PC RPLND who underwent modified RPLND
- All had unilateral, small volume metastasis at initial presentation
- 100 patients; 98 received induction chemo, 2 salvage
- This represents < 10% of PC RPLND during this time period

**PC Modified RPLND**

- 43 right modified, 39 left modified, 18 left full modified (includes superior IAC nodes)
- 94 had B1 or B2 tumor (1-5cm tumor) pre and post chemo
- Teratoma 62%, fibrosis 36 %, germ cell cancer 2%
- 4 relapses: 1 left modified in the chest; 3 right modified in the pelvis, retrocrural, and inguinal.
- No relapses occurred in an area which would have been included in a full bilateral dissection
- Median f/u 32 months

**Modified PC RPLND**

Heidenreich, et al

- Lesions < 2 cm, lesions 2-5 cm if in appropriate position based upon primary
- Lesions >5 cm had full bilateral RPLND
- 104 modified dissections
- 5 relapses, one within the boundaries of modified dissection
- Morbidity lower with modified dissections

**What about a normal CT post chemotherapy?**

- If PC RPLND is performed on patients with normal markers after chemo, approximately 20% will have either teratoma or cancer in the specimen (European and MSK experience)
- Hence, they advocate PC RPLND on all, regardless of a normal CT
- We observe these patients and approx. 5% recur
**Long Term Followup of BEPx4 vs BEPx3**

Saxman, JCO, 16:702, 1998

- Median f/u 10 years
- 92% had actual f/u > 5 years
- 118 patients treated a IU on this trial
- 4 relapses with germ cell cancer; all are survivors after salvage chemotherapy
- 4 additional patients relapsed with teratoma (where the relapse was not mentioned) and all are long term survivors
- So, even if all of these were in the RP, the clinical relapse rate is 6%, and all were eventually cured
- It is tough to rationalize operating on all 118; further, we don’t know if operating would have prevented recurrence.

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**PC RPLND for High Volume Teratoma**

AUA, 2006

- 1995 to 2005; all patients with >10 cm teratoma
- 99 patients met selection criteria
- All had PC RPLND
- One postoperative death

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**> 10 cm Teratoma**

- 41% had one site of disease; 41% had 2-3; 17% had >4 sites
- 31% had nephrectomy
- 7% had vena cava resection
- 64% were good risk at presentation
- 89% had first line chemotherapy only

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**Complications**

- 39 patients had a total of 46 complications (23 minor, 23 major)
- Major: mucous plug (2), cord paralysis (1), bowel obstruction (1), duodenal resection (4), chylous ascites (5), cardiac tamponade (1), bundle branch block (1), iliac artery injury (2), ureteral injury (1), DVT (1), left colon ischemia (2), bacteremia (1), death (1)
>10 cm Teratoma

- Mean and median hospital stays were 7.3 and 5 (3-51)
- 2 and 5 year disease free survival was 86% and 74%
- Mean and median followup was 42 and 38 months
- 23 recurrences: 2 died of disease, one is alive with disease, one is lost to f/u
- 4/23 recurred with elevated markers
- Others recurred with teratoma, except for 2 (sarcoma and yolk sac tumor)

>10 cm Teratoma

- On multivariable analysis, no variable was predictive of disease recurrence
- This is probably due to uniform selection criteria, and the fact that all patients had massive teratoma
- Earlier studies suggested that higher volume teratoma at initial resection is predictive of recurrence

MSK Experience
JCO 25:1033, 2007

- 210 patients
- Median f/u 37 mo., 30 recurrences
- Median tumor size 3 cm (interquartile range 1.5-5.3 cm)
- Probability of remaining disease free and 5 and 10 years was 83% and 80%
- On multivariable analysis, residual mass size and IGCCC risk category predictive of recurrence

Selection for PC RPLND

- First or second line chemotherapy
- Normal tumor markers
- Acceptable surgical morbidity
- What about localized RP tumor with elevated markers?
PC RPLND  
elevated markers

- Desperation RPLND experience has revealed that around 30% of patients with localized RP cancer who have failed all chemo can be cured with surgery
- In late relapse we can cure around 30% who have cancer in the specimen by surgical removal of tumor
Conclusions

• Low stage disease is curable; pick therapy based upon informed consent and local capabilities
• Postchemotherapy surgery remains important in the therapy of this disease
• We need to continue to train some people to perform open surgery, at least in the short term