17th Multidisciplinary Management of Cancers: A Case-based Approach

# Sarcoma Tumor Board

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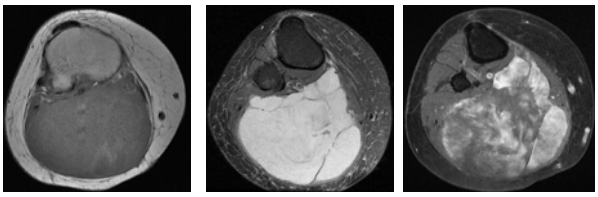
## Case 1 – Sarcoma Tumor Board



T1 isointense, T2 hyperintense, and enhancing with mass effect on the neurovascular bundle and possible encasement of the deep peroneal nerve.

17th Multidisciplinary Management of Cancers: A Case-based Approach

## Case 1 – Sarcoma Tumor Board

- 63F with 20 cm soft tissue mass right popliteal fossa increasing in size over past 2 months
- PMH significant for DM2, morbid obesity (BMI 36), and OSA
- Exam notable for 20 x 10 cm firm, immobile, but well-circumscribed mass extending from popliteal fossa to mid-calf
- Motor function intact, but loss of sensation in right 1st web space

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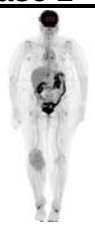
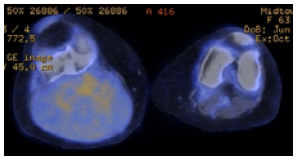
## Case 1 – Sarcoma Tumor Board

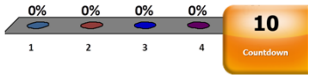




SUV max ~ 4 with non-specific activity in mediastinal and axillary nodes

**Question: What do you recommend next?**

1. Incisional biopsy leg tumor
2. Image-guided biopsy leg tumor
3. Image-guided biopsy leg tumor and mediastinal/axillary adenopathy
4. Excision leg tumor

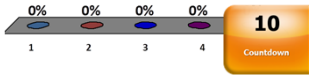







**Question: What do you recommend next?**

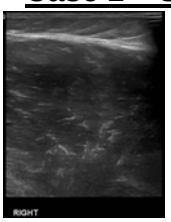
1. Wide resection
2. Neoadjuvant radiotherapy
3. Neoadjuvant chemotherapy
4. Combined modality neoadjuvant therapy

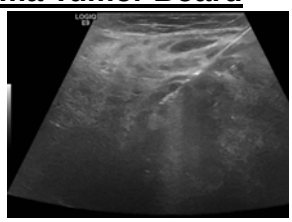







## Case 1 – Sarcoma Tumor Board



Right lower leg biopsy c/w mxyoid/round cell liposarcoma
Round cell (high grade) component comprises ~ 10% of tumor



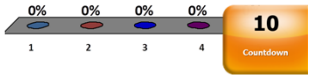


## Case 1 – Sarcoma Tumor Board

- Neoadjuvant chemotherapy Adriamycin 75 mg/m2 and Ifosfamide 9000 mg/m2 x 2 cycles completed (AIM)
- Treatment complicated by multiple grade 2 – 3 side effects:
  - Mucositis
  - Perianal ulceration
  - Nausea and vomiting

**Question: What do you recommend next?**

1. Ongoing AIM chemotherapy, dose reduced
2. Alternative chemotherapy (e.g. Trabectedin)
3. Surgical resection
4. Neoadjuvant radiotherapy





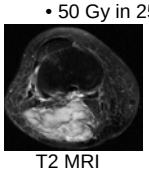

## Case 1 – Sarcoma Tumor Board

- Surgical resection, including:
  - Wide resection tumor
  - Exploration of popliteal artery
  - Preservation tibial and common peroneal nerves
- Pathology:
  - SOFT TISSUE, RIGHT CALF (RESECTION):
    -NO RESIDUAL VIABLE LIPOSARCOMA, POST CHEMORADIATION THERAPY
- Postoperative course complicated by wound breakdown with exposed vessels requiring free tissue transfer of latissimus dorsi muscle with microvascular anastomosis.

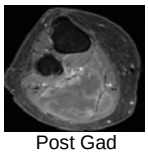


## Case 1 – Sarcoma Tumor Board

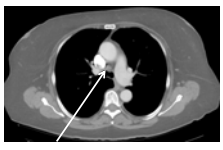
- Neoadjuvant radiotherapy
  - IMRT
  - 50 Gy in 25 fractions



T2 MRI



Post Gad



**Next Step – Surgery?**



## Case 1 – Sarcoma Tumor Board

- Follow up:
  - NED 1 year post resection
- Discussion/ Questions?

# •End of Case 1

## Case 2 – Sarcoma Tumor Board

- 76M with 12 cm mesenteric mass detected after several week history of abdominal pain
- PMH notable for laparoscopic hemicolectomy for dysplastic polyp, aortic stenosis, Vtach with pacemaker, prostate cancer s/p prostatectomy, and bilateral hip replacement
- Clinical evaluation no pain or tenderness



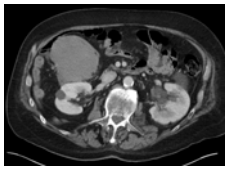
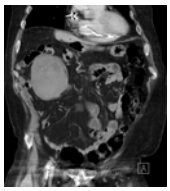
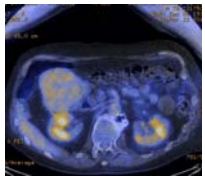
## Case 2 – Sarcoma Tumor Board

- **Biopsy**

A. SOFT TISSUE, ABDOMINAL MASS (BIOPSY):
- FIBROMATOSIS (DESMOID TUMOR).
- IMMUNOHISTOCHEMISTRY:
  B CATENIN - FOCALLY POSITIVE
  VIMENTIN - POSITIVE
  KERATINS AE1/AE3 - NEGATIVE
  S100 - NEGATIVE
  KI67 - LOW, NUCLEAR POSITIVE 1%



## Case 2 – Sarcoma Tumor Board

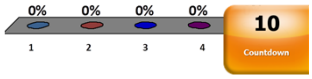
CT – 12 cm mesenteric mass adjacent to partial colectomy

PET – SUV max 5.2



## Question: What do you recommend next?

1. Observation
2. Sorafenib
3. Excision
4. Radiotherapy
5. Tamoxifen/ sulindac



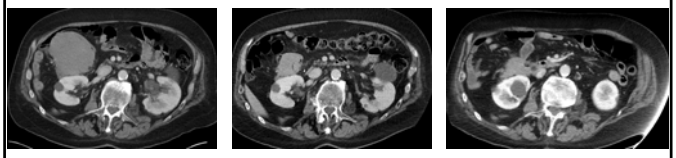
## Case 2 – Sarcoma Tumor Board

- Desmoid/ fibromatosis are locally aggressive tumors with no known potential for metastasis or dedifferentiation
- High rate of local recurrence even after complete resection
- Unpredictable/ variable clinical course
- NCCN guidelines now endorse observation as a primary therapeutic option for patients with desmoid tumors that are potentially resectable but asymptomatic, non-life threatening, and not causing significant impairment
- European studies report 5-year PFS rates of 50% with observation



## Case 2 – Sarcoma Tumor Board

- This patient was observed with ongoing partial response over 3+ years of follow up



Diagnosis 2 Years 3 Years



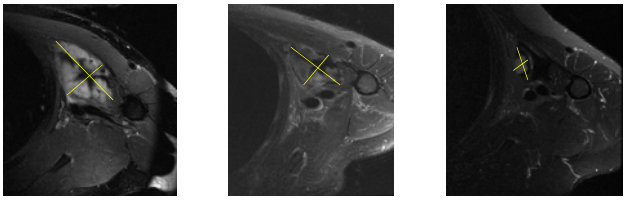
## Case 2 – Sarcoma Tumor Board

- Multiple systemic therapy options exist
- Tamoxifen/ sulindac with 50% clinical benefit rate, but case series are SMALL
- Sorafenib with 25% PR and 40% stable disease in phase II trial from MSKCC
  - Phase III trial in process
- Favorable response rates are reported with low dose doxorubicin (50 mg/m$^2$) and liposomal doxorubicin with improved side effect profile



## Case 2 – Sarcoma Tumor Board

- 51M with left axillary desmoid tumor treated with observation



Diagnosis 1 Years 2 Years

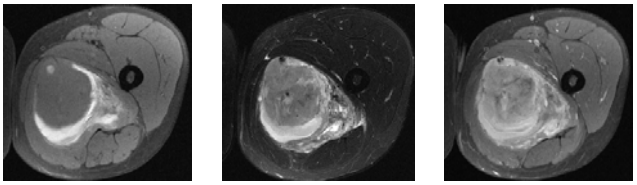
## Case 2 – Sarcoma Tumor Board

•Discussion/ Questions?

•End of Case 2



## Case 3 – Sarcoma Tumor Board



T1 FS T2 Post Gad

16 cm avidly enhancing mass, T1 hyperintensity which does not fat suppress, and internal calcification

**Diagnosis?**



## Case 3 – Sarcoma Tumor Board

- 40M with 3 month history of progressive soft tissue tumor left adductor compartment
- No past medical or surgical history
- Exam 12 cm mass inner thigh near inferior pubic ramus
- No sensory/ motor changes



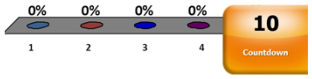
## Case 3 – Sarcoma Tumor Board

- Biopsy confirms X;18 translocation positive synovial sarcoma
- SYNOVIAL SARCOMA, MONOPHASIC SPINDLE CELL TYPE
  - -IHC

| | |
|---|---|
| BCL-2 | POSITIVE |
| EMA | POSITIVE |
| BER EP4 | NEGATIVE |
| AE1/AE3 | NEGATIVE |
| CD34 | STAINING IN VESSELS ONLY |
| CD99 | STRONG MEMBRANOUS POSITIVITY |
| SMA | STAINING IN VESSELS ONLY |
| Ki67 | 15% |

**Question: What do you recommend next?**

1. Wide resection
2. Neoadjuvant radiotherapy
3. Neoadjuvant chemotherapy
4. Combined modality neoadjuvant therapy






## Case 3 – Sarcoma Tumor Board

Questions

1) Proceed to excision?
2) Nodal evaluation?

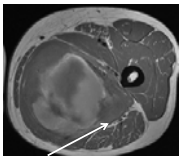
Discussion?

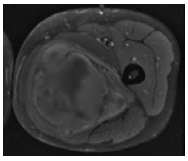


## Case 3 – Sarcoma Tumor Board

- Neoadjuvant inter-digitated chemo-radiation
  - 50 Gy IMRT
  - AIM x 3
    - Doxorubicin 75 mg/m2 + Ifosfamide 9000 mg/m2

Post-Rx MRI





Post-Gad

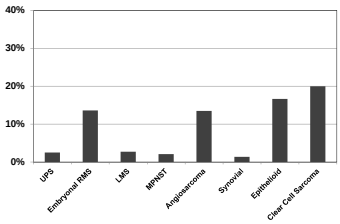
Sciatic nerve

T1



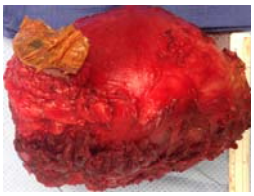
## Case 3 – Sarcoma Tumor Board

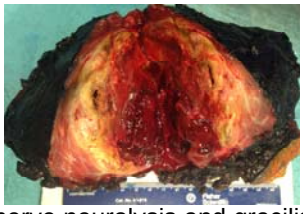
**Rate of Lymph Node Positivity**




- Prospective trial Germany
  - 2/42 (4.8%) synovial sarcoma patients SLN positive
- Retrospective analysis Univ Cincinnati PET vs. SLN biopsy in pediatric and AYA patients
  - SLN superior to PET
  - Overall, 7/28 (25%) LN positive

## Case 3 – Sarcoma Tumor Board





Wide resection with sciatic nerve neurolysis and gracilis muscle pedicled flap



## Case 3 – Sarcoma Tumor Board

- Disease-free for 18 months when develops pulmonary metastases
- Systemic therapy re-initiated with gemcitabine/docetaxel
- Stable disease x 4 months

- Discussion/ Questions?

- End of Case 3



## Case 3 – Sarcoma Tumor Board

- **DIAGNOSIS**

**A. SOFT TISSUE, LEFT INGUINAL (RESECTION):**
**-RESIDUAL SYNOVIAL SARCOMA, POST CHEMORADIATION THERAPY**
**-10% VIABLE TUMOR WITHIN MASS**
**-NO INVOLVMENT OF SURGICAL MARGINS**

- No additional therapy postoperatively



## Case 4 – Sarcoma Tumor Board

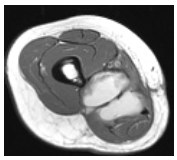
- 63F with recurrent mass right medial thigh
  - July 2010, 15 cm primary enhancing mass of proximal adductor compartment
  - Surgery performed, R0 resection, closest margin 3 mm
  - Adjuvant RT to 63 Gy
- 15 months later, January 2012
  - 2 enhancing masses in surgical bed
  - Re-excision → recurrent tumor, R1 resection
  - No further therapy

## Case 4 – Sarcoma Tumor Board

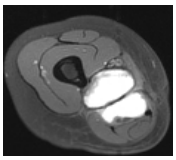
September 2012

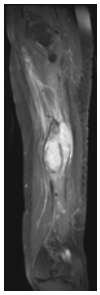
- Enhancing mass in surgical bed
- Biopsy confirms recurrent undifferentiated pleomorphic sarcoma (UPS)
- CT C/A/P → No Mets

T1



Post Gad



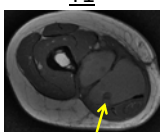




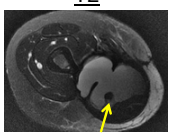
## Case 4 – Sarcoma Tumor Board

- Repeat EBRT administered
- Post-RT imaging shows no mets but highly suspicious for sciatic nerve encasement?

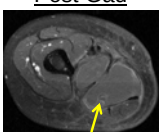
T1



T2



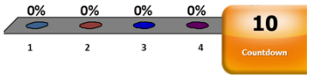
Post Gad





## Question: What do you recommend next?

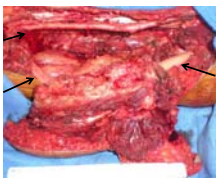
1. Excision
2. Neoadjuvant chemotherapy
3. Neoadjuvant repeat radiotherapy
4. Proximal amputation

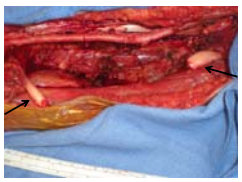





## Case 4 – Sarcoma Tumor Board

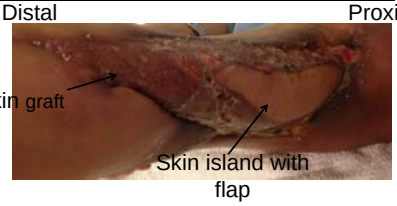
- Limb-sparing surgery with en bloc sciatic nerve resection and microvascular latissimus dorsi flap/skin graft





## Case 4 – Sarcoma Tumor Board

Distal Proximal



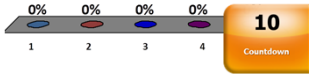

- Ambulated with walker x 8 months
- Currently ambulates with cane and ankle-foot orthosis
- NED x 45 months



Biopsy → Dedifferentiated Liposarcoma
Baseline staging studies → No Mets

## Question: What do you recommend next?

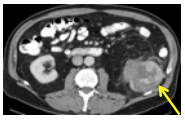
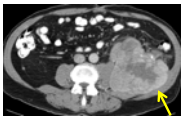
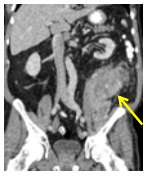
1. Wide resection
2. Neoadjuvant radiotherapy
3. Neoadjuvant chemotherapy
4. Combined modality neoadjuvant therapy






## Case 5 – Sarcoma Tumor Board

- 67M with 3 month history of progressive left hip and flank pain with palpable LLQ mass
- PMH significant for HTN and GERD
- CT 20 x 13 x 13 cm left RP mass

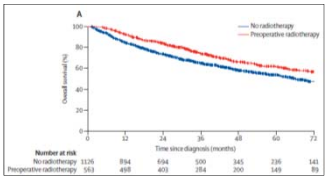






## Case 5 – Sarcoma Tumor Board

- Primary therapy = neoadjuvant RT and multivisceral resection (kidney and colon)
- Pathology = 21.5 cm dedifferentiated liposarcoma
- Postop RT limited by tolerance of radiosensitive bowel and liver
- Postop RT not routinely offered in many centers because of concerns about narrow benefit/risk ratio
- Ongoing EORTC trial (NCT01344018) randomizing patients to preoperative RT and surgery versus surgery alone. Known as the STRASS trial, trial is accruing well, but results are not expected until 2020

## Case 5 – Sarcoma Tumor Board



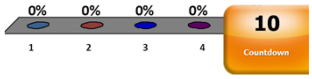
- Case-control analysis of ~9000 RP patients using NCDB data from 2003 – 2011
- Propensity matching of ~ 1700 patients
- OS improved from 66 months to 110 months with preoperative RT

Nussbaum et al, *Lancet Oncol.* 2016 Jul;17(7):966-75



## Question: What do you recommend next?

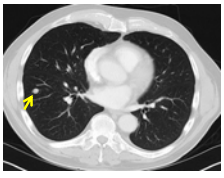
1. SBRT
2. Cytotoxic chemotherapy plus wedge resections
3. Wedge resections
4. Olaratumab plus chemotherapy

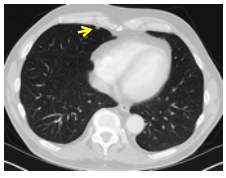





## Case 5 – Sarcoma Tumor Board

- 10 months after completion of therapy:
  - CT Chest with 11 mm and 7 mm nodules in right hemi-thorax

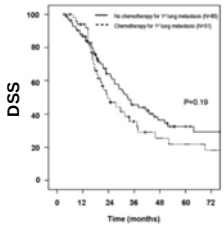






## Case 5 – Sarcoma Tumor Board

- Stratified analysis from MSKCC of patients undergoing metastasectomy for lung mets from extremity STS failed to show difference between resection vs. resection plus chemotherapy
- Recent report of 30 STS patients treated with SBRT showed 86% local control and 43% OS at 2 years
  - 50 Gy in 4 – 5 fractions




*Cancer.* 2007 Nov 1;110(9):2050-60

## Case 5 – Sarcoma Tumor Board

- Follow up:
  - NED 58 months from initial diagnosis
  - NED 44 months from metastasectomy
- Discussion/ Questions?

- End of Case 5

17th Multidisciplinary Management of Cancers: A Case-based Approach

## End of the Sarcoma Tumor Board

Thank you for your participation!