Pathologic Femur Fractures on Call

An Overview an Update

November 3, 2018
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Disclosures

I have no relevant financial disclosures.

But while any gems have come from those kind enough to teach,

The deficiencies are my own.

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Take-Away Points

1. Metastatic bone disease is **not** a pre-terminal event
2. If there is pain with every step → Act!
3. In select cases, resection may be curative or otherwise advantageous

Pathologic Femur fractures are common and manageable, but feel free to reach out if questions

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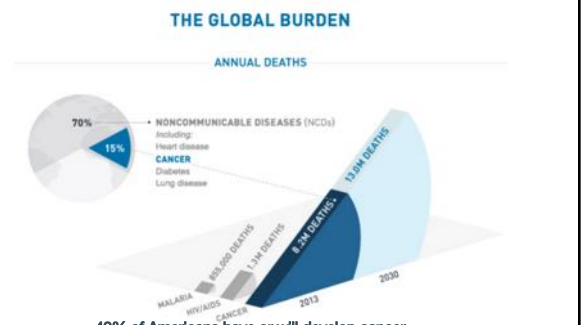
Metastatic Disease



~40% of Americans have or will develop cancer
50% of all cancer patients develop bone metastases
10% sustain a pathologic fracture

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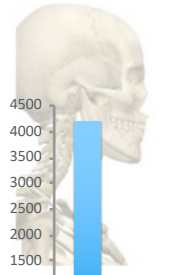
Metastatic Disease to Bone



Over 150,000 new cases each year

Most
Bone Cancers
are a metastasis
of another cancer.

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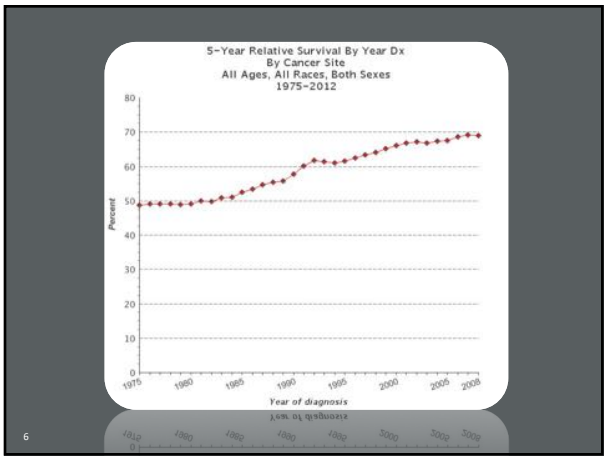

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Bone metastases **are not** a Pre-terminal event

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Treatment should allow for immediate function.

NWB

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Plan for Radiation…

- **Prostate**
  - Radiosensitive + Blastic
  - 44% Fracture Healing
- **Breast**
  - Radiosensitive
  - 37% Fracture Healing
- **Lung**
  - Radioresistant
  - 0% Fracture Healing

But don't plan on Union

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Fracture Fixation: Nonmetastatic vs Metastatic

Bone Heals, Or Hardware Breaks

Hardware Breaks, Or patient succumbs

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What next?

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Scenario:
no known malignancy

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Scenario:
prior malignancy (eg., melanoma), no evidence of disease prior to the fracture

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Scenario: current prostate cancer, no known metastatic disease to bone

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Scenario:
lung cancer,
biopsy-proven widespread
metastatic disease to bone

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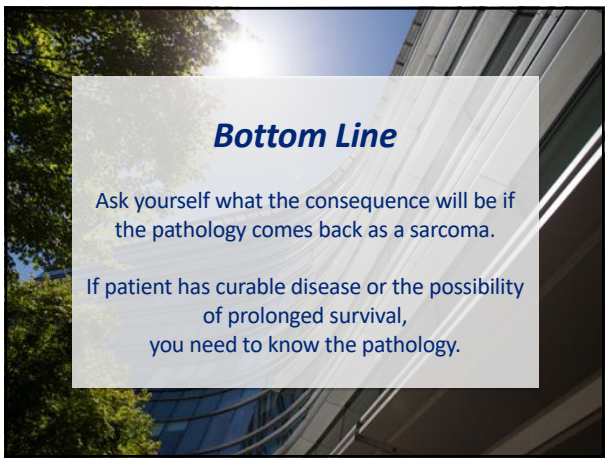

So how do we avoid fractures in metastatic bone disease?

TABLE 1. Mirels' Rating System for Prediction of Pathologic Fracture Risk

Score	Site	Nature	Size[1]	Pain
1	Upper extremity	Blastic	<1/3	Mild
2	Lower extremity*	Mixed**	1/3–2/3	
3	Peritrochanteric	Lytic	>2/3	Functional

A score > 8 points indicates a high fracture risk, and need for consideration of prophylactic fixation

But it is **not reliable** between orthopaedic surgeons or even orthopaedic oncologists!
(Bone Joint J 2018;100-B:1100–5.)

Weight-bearing pain, also known as pain with every step
=
High risk for pathologic fracture!

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Prophylactic stabilization is…

A faster recovery

Less painful

More predictable

Less expensive
PMID: 27020430

… than fixing pathologic fractures

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Prophylactic stabilization is…

Maybe associated with improved survival?

Prophylactic Stabilization Of Metastatic Femoral Lesions Has A Survival Benefit Compared To Pathologic Femur Fracture Fixation

Travis Philipp MD, Jacob Mikula BS, Yee Doung MD, James Hayden MD PhD, Kenneth Gundle MD

October, 11, 2018 | MSTS Annual Meeting: NYC : PRESENTED BY Travis Philipp, MD

… than fixing pathologic fractures

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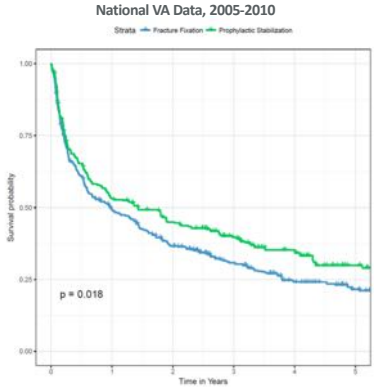
Univariate Survival



Unadjusted survival was higher for those receiving prophylactic stabilization. HR = 0.8

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Proportional Hazards Models

Variable	Hazard Ratio	P Value
Treatment of Metastatic Lesion		
Prophylactic Stabilization	**0.75**	0.002
Pathologic Fracture Fixation	Ref	
Gagne Comorbidity Score	4.0	<0.001
Site		
Hematologic	Ref	
Kidney	3.0	<0.001
Liver	6.6	<0.001
Lung	4.2	<0.001
Prostate	1.8	<0.001

Improved survival persisted when adjusted for comorbidity and primary cancer diagnosis.

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Own the Bone!

After surgery if not before…

1. Bone strengthening agent
2. Referral for Radiation

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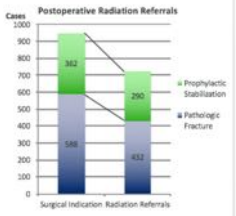
Own the Bone!

Patterns of Radiation Referral After Femoral Stabilization in Metastatic Disease

Andrew R Summers BS, Travis Philipp MD, David Putnam MD, Phillip Lam BS, Kenneth Gundle MD

National VA Data, 2005-2010



Patients with completed pathologic fractures were less likely to be referred than those stabilized prophylactically, though rates in both groups were high (73 vs 80%, p=0.02).

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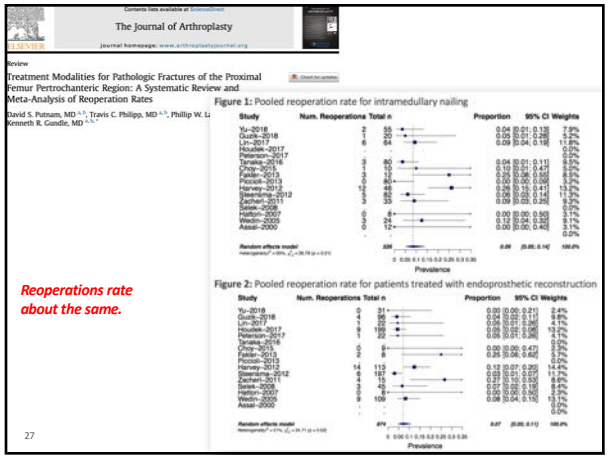
What about arthroplasty for proximal femur metastatic disease?



Reoperations rate about the same.

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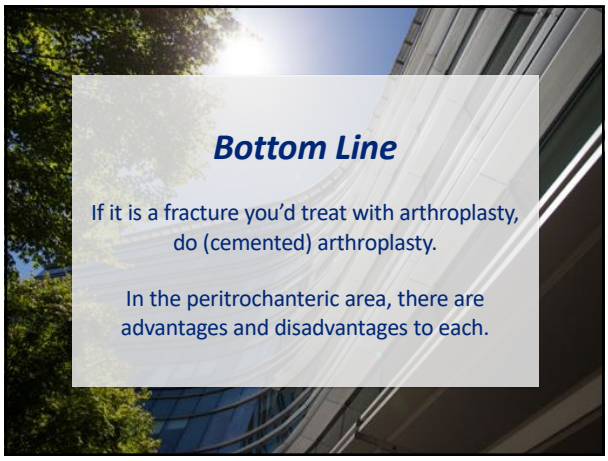

When should negative-margin resection be considered?

Renal cell carcinoma with late (>12 months) solitary bone met – ~30% cure
PMID: 20598157, 17671020, 10697316

Possibly similar approach in isolated/oligometastatic breast (PMID 24803881), case reports in lung cancer (PMID 16401990).

Is this the future of treatment responsive metastases?

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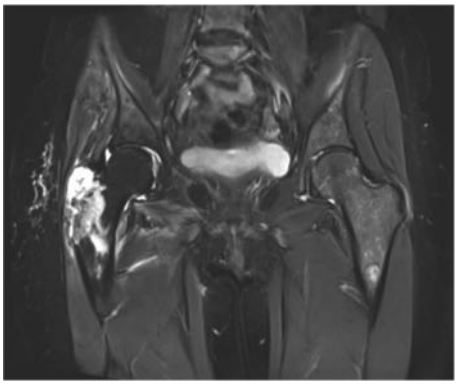

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Questions/Discussion

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Thank You

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