

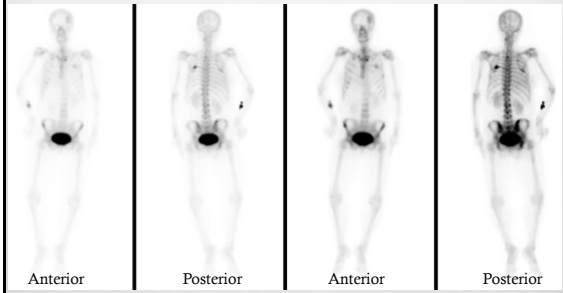
Potpourri of Pearls for General Clinical Nuclear Medicine Practice

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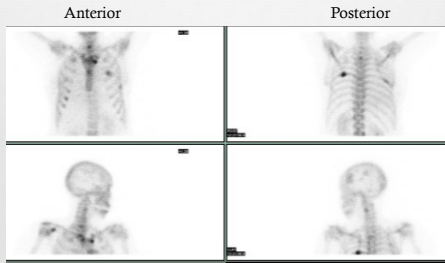
No Conflict of Interests to Declare

New diagnosis of non-small cell lung carcinoma



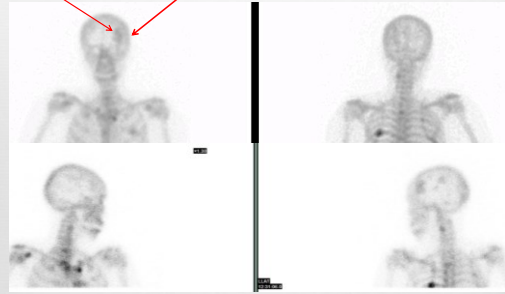
Case 1

Spot Views



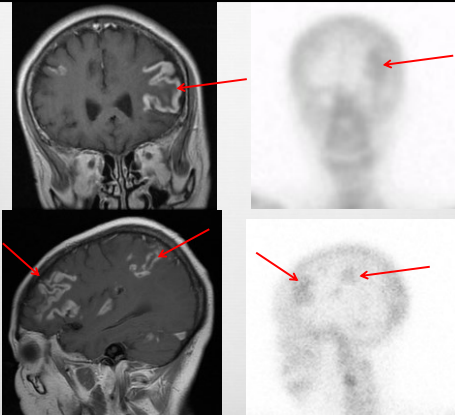
Case 1

Uptake Not Exactly in the Lateral Calvarium *Lateral calvarium* *Activity is much lower than in other skeletal sites*

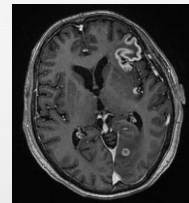


There is a radiotracer uptake with a patchy, gyriform morphology that does not appear to precisely localize to the lateral calvarium = suspect brain mets

Case 1



Case 1



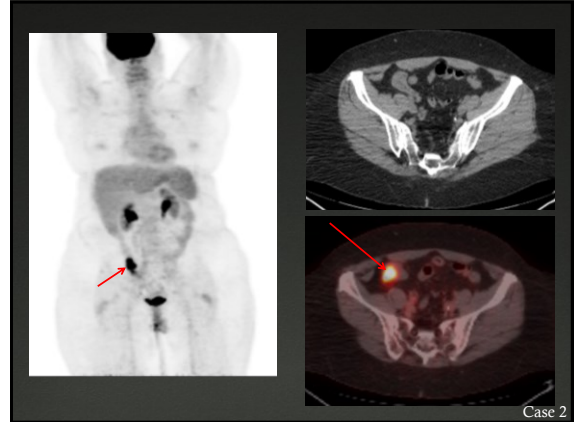
Extensive gyral leptomeningeal enhancement, compatible with the presence of intracranial metastatic disease. There is "gyriform" radiotracer uptake correlating in morphology and distribution to the pattern of leptomeningeal enhancement. This is attributed to break-down of the blood-brain barrier. There was no evidence of calvarial metastases on MRI.

Case 1

Clinical History

- ⌚ 52 year old female with a history of diffuse large B-cell lymphoma, initially presenting in 2014 with a mediastinal mass with SVC syndrome
- ⌚ Status post chemotherapy followed by autologous stem cell transplant, two years prior
- ⌚ Now presenting with abdominal pain
- ⌚ Negative colonoscopy 4 months prior to PET-CT imaging

Case 2



Case 2

Summary of Imaging Findings

- ⌚ Intense, focal hypermetabolism involving the cecum (maximum SUV 20.6)
- ⌚ There is no correlate on the low-dose, non-contrast CT.
- ⌚ There are no other relevant findings on PET or the low-dose CT.
- ⌚ A recent colonoscopy (four months earlier) was negative.

Case 2

Interpretation and Recommendations

- ⌚ How would you interpret these findings, in light of the clinical history?
- ⌚ What would you recommend to the referring oncologist?

Case 2

Repeat Colonoscopy

- ⌚ A repeat colonoscopy obtained three weeks following the PET-CT was again negative.
- ⌚ Biopsies were not obtained.
- ⌚ **Q:** What was NOT done?
- ⌚ **A:** Endoscopic Ultrasound in search of submucosal lesions to explain the PET/CT findings

Case 2

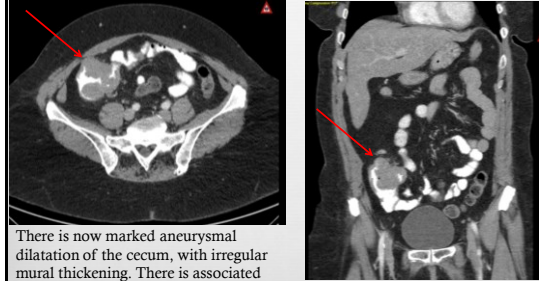
Submucosal Neoplasms in the Colon and Rectum

- ⌚ Neoplasms with an Intramural Origin
 - ❖ Lipoma
 - ❖ Lymphoma
 - ❖ Carcinoid tumor
 - ❖ Hemangioma
 - ❖ GIST
 - ❖ Other primary tumors
- ⌚ Hematogenous metastases
 - ❖ Neoplasms with an Extramural Origin
 - ❖ Direct invasion by extracolonic tumor
 - ❖ Peritoneal carcinomatosis
 - ❖ Appendiceal tumor

Non-Hodgkin Lymphomas (NHL)

- ☞ Mainly expressed as nodal disease involvement
- ☞ 40% of cases will present as primary or secondary extra-nodal presentation
 - ☞ GI tract represents the most involved extra-nodal site
 - ☞ GI tract involved in >20% of nodal NHL

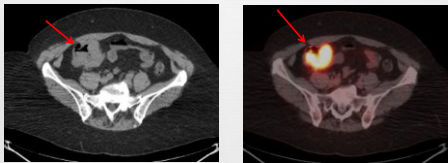
Six Month Follow-Up Abdominal CT



There is now marked aneurysmal dilatation of the cecum, with irregular mural thickening. There is associated intense FDG uptake (SUVmax 19.6).

Case 2

Six month follow-up PET-CT



There is now marked aneurysmal dilatation of the cecum, with irregular mural thickening. There is associated intense FDG uptake (SUVmax 19.6).

Case 2

38 y/o female with coughing, hoarseness and feeling of "pressure on esophagus"

- ☞ Fall 2015 the above complaints
- ☞ US showed 2 right pole nodules, 16 and 12 mm
- ☞ Bx not sufficient tissue, follicular morphology
- ☞ Dr. S performed hemi on 2/16, classical papillary 1.5 cm, positive posterior margin
- ☞ Dr. S gave the patient options, 1) observation with US versus 2) complete thyroidectomy
- ☞ Patient decided to do completion thyroidectomy

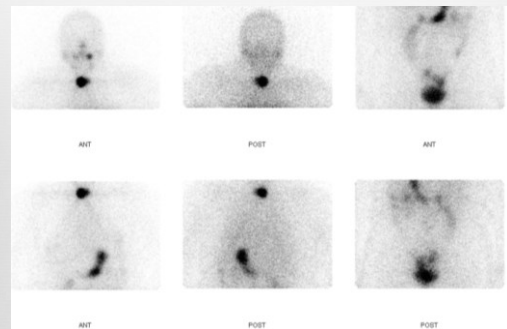
Case 3

38 y/o female with coughing, hoarseness and feeling of "pressure on esophagus"

- ☞ 4/7/16 completion thyroidectomy, 2 and 1 mm papillary Ca., presumed Stage I
- ☞ Dr. S. recommends no RAI
- ☞ Dr. M. (Endo.) recommends no RAI
- ☞ Later that month, Tg is 19.2, Ab 1, TSH 0.08
- ☞ Post-op US, a suspicious LN, but bx was negative for PTC
- ☞ Patient elected to proceed with RAI evaluation and treatment according to DxRAIS/Tg findings

Case 3

Pre-Treatment WBS 10/24/16



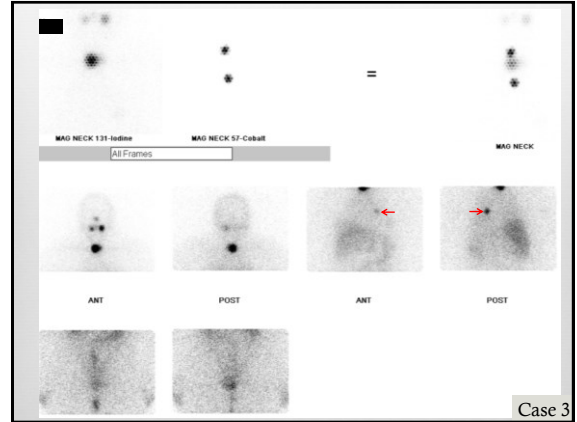
Case 3

38 y/o female with "Stage I"

- ☞ 24 hr. uptake in the neck = 1.5%
- ☞ Max Tg expected would be $(1.5 \times 2) + 1 = 4$
- ☞ 10/20/16 TSH 70.6, Tg 74, Ab 1
- ☞ RAI-WBS, remnant benign thyroid, no mets
- ☞ Conclusion: Tg out of proportion to remnant normal thyroid; hence, occult tumor present, too small to detect vs. NIA
- ☞ RAIT, ablative & adjuvant activity, 150 mCi
- ☞ Post-treatment RAI-WBS to follow

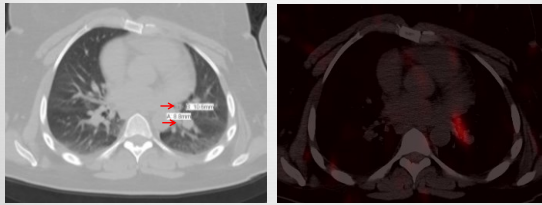
NIA = non-iodine avid

Case 3



Case 3

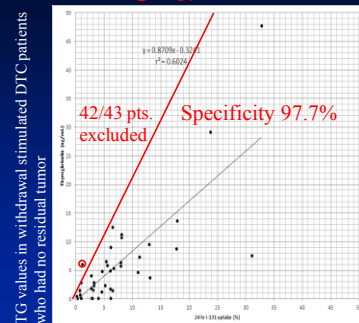
38 y/o female with "Stage I" POST-TREATMENT SPECT-CT Lung mets, Stage II



Case 3

First Post-Thyroidectomy Evaluation Patient's $Tg \leq [(24\text{Hr. \%IU} \times 2) + 1]$

Tulchinsky M. 2014



24 hour I-131 uptake probe results (%)

PSU Protocol

38 y/o female with surgical path = "Stage I"

- ☞ 24 hr. uptake in the neck = 1.5%
- ☞ Max Tg expected would be $(1.5 \times 2) + 1 = 4$
- ☞ 10/20/16 TSH 70.6, Tg 74 (Ab 1), hence, there is more tissue producing Tg than just the benign remnant
- ☞ This explains the finding of the lung met on post-treatment scan, previously covert source of extra Tg

Case 3

Conclusion

- ☞ Close scrutiny of non-skeletal findings could yield critical findings on skeletal scintigraphy
- ☞ If intestinal lesion on PET/CT followed by negative endoscopy, suspect submucosal pathology that would take endoscopic ultrasound to reveal
- ☞ Thyroglobulin level under thyroid hormone withdrawal stimulation offers reliable tipoff to suspect residual tumor that may be obscure on diagnostic ^{131}I scan