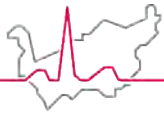


Hôpital du Valais
Spital Wallis

L'imagerie fonctionnelle PET/CT

Ehab M. Kamel, MD

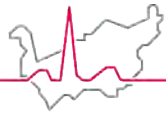
**Service de Médecine Nucléaire,
centre hospitalier du valais romand (CHVR), Sion, CH**



Pourquoi fonctionnelle ??

Contrairement à L'imagerie conventionnelle, les techniques d'imagerie fonctionnelle estiment la fonction des organes, des tissus ou des cellules, c'est-à-dire leur métabolisme

Les techniques d'imagerie fonctionnelle sont la scintigraphie et le PET scan

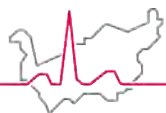


PET/CT théorie

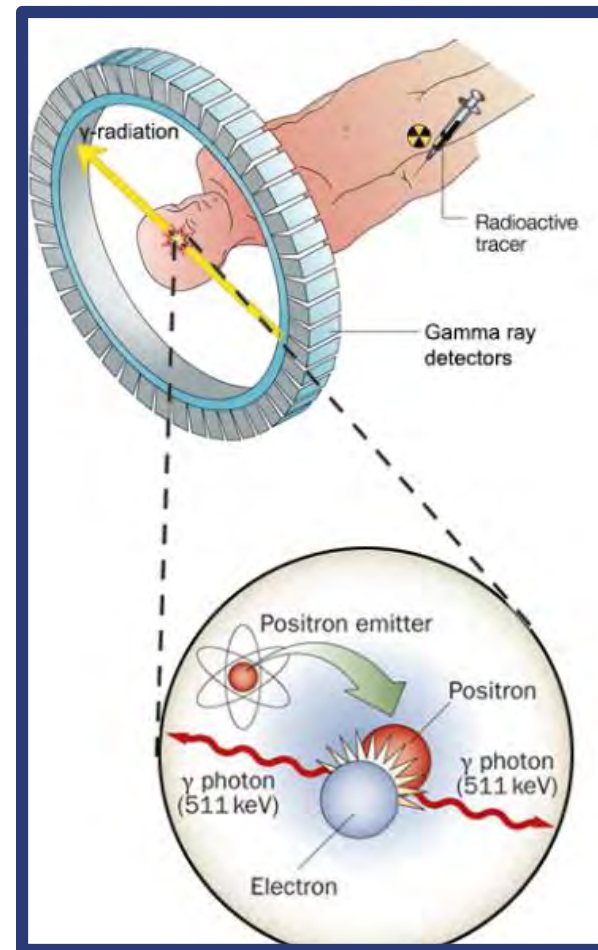
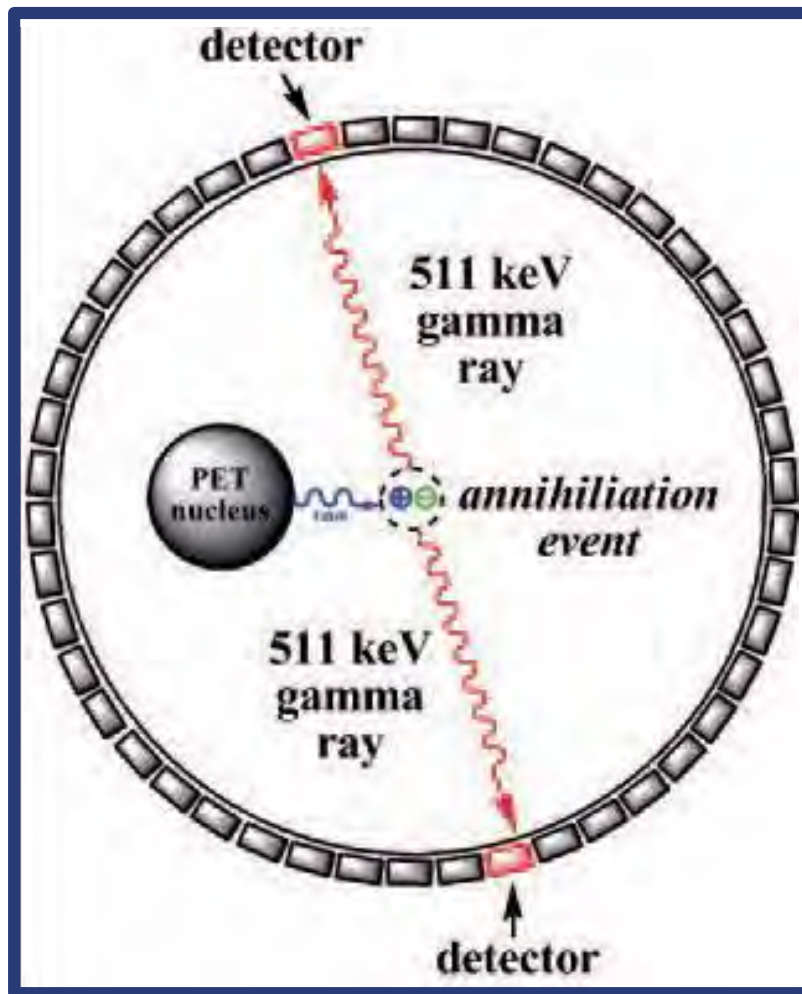
Le fluorodésoxyglucose (^{18}F -FDG) est un analogue radiopharmaceutique du glucose qui se désintègre par radioactivité B+, c'est-à-dire en émettant des positons

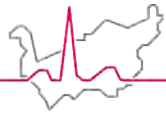
Comme le glucose, il franchit la membrane cellulaire mais, à la différence du glucose, il s'accumule dans la cellule, une particularité qui favorise l'imagerie

PET/CT théorie



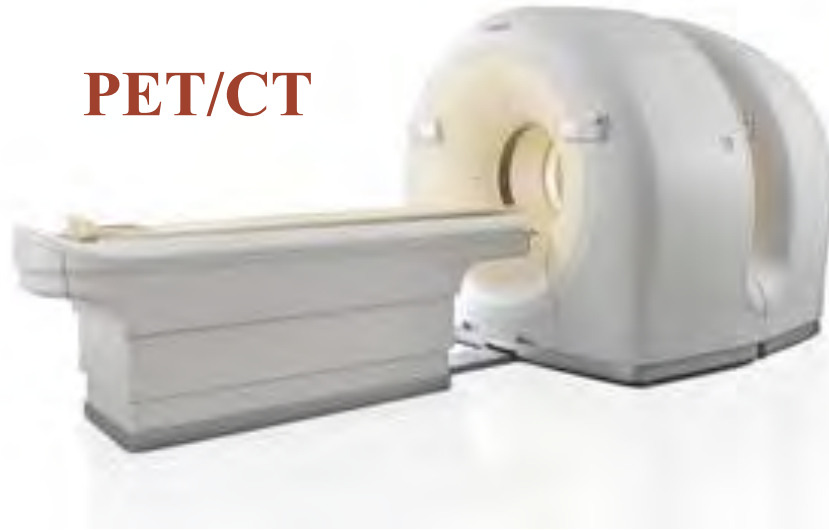
Hôpital du Valais
Spital Wallis



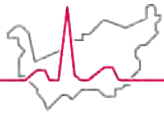


PET/CT Théorie

PET/CT



L'imagerie PET combinée au scanner CT permet d'obtenir deux examens simultanément : l'examen PET étudie l'activité biologique des organes, tandis que l'examen CT étudie l'anatomie et la morphologie des organes

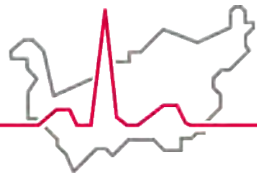


PET/CT mais quel patient

Patientes à haut risque de maladie disséminée

Anomalie morphologique locorégionale ou à distance

Suspicion clinique, radiologique ou laboratoire d'une récurrence post traitement

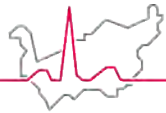


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Spital Wallis

PET/CT mais quel patient

Cet examen est contre-indiqué chez les femmes enceintes

Les femmes allaitantes devant être examinées devront interrompre les tétées pendant les 24 heures qui suivent l'examen



Bilan d'extension du Cancer

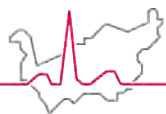
Tumeur primaire sensibilité ~ 95% pour les lésions >5mm

Précisément N-staging 83% PET/CT

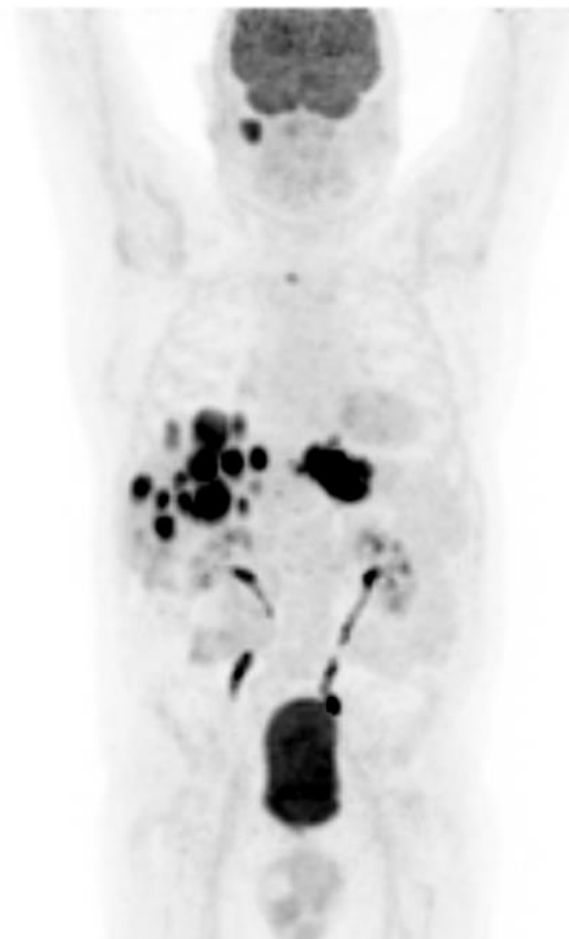
Précisément N-staging 60% CT/IRM

Métastase à distance; précisément globale ~90%

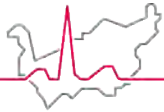
Œsophage-Bilan initiale



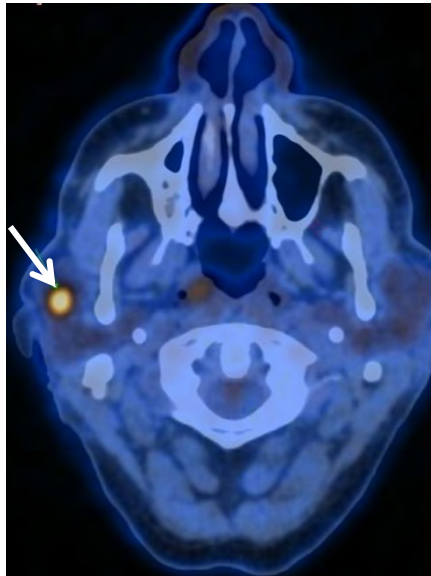
Hôpital du Valais
Spital Wallis



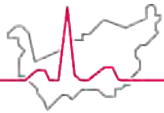
Tumeur de Warthin



Hôpital du Valais
Spital Wallis



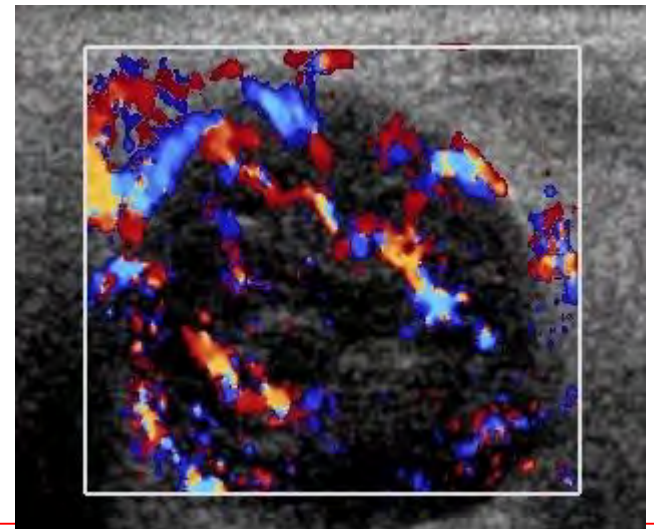
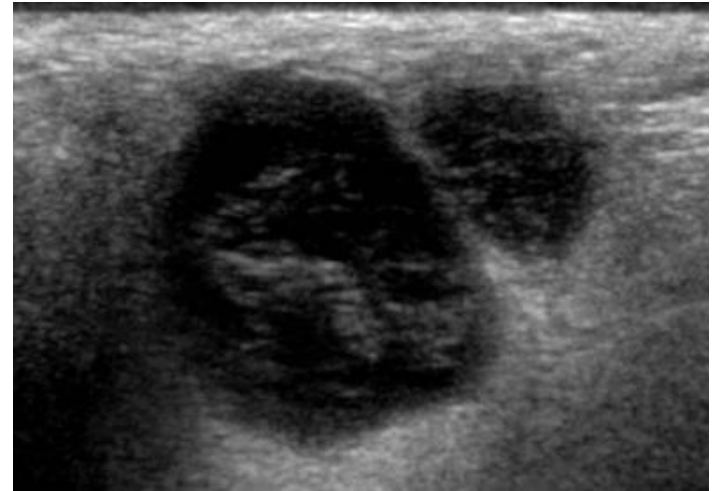
Tumeur de Warthin



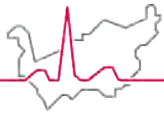
Hôpital du Valais
Spital Wallis

✓ Typical Warthin sonographic appearance

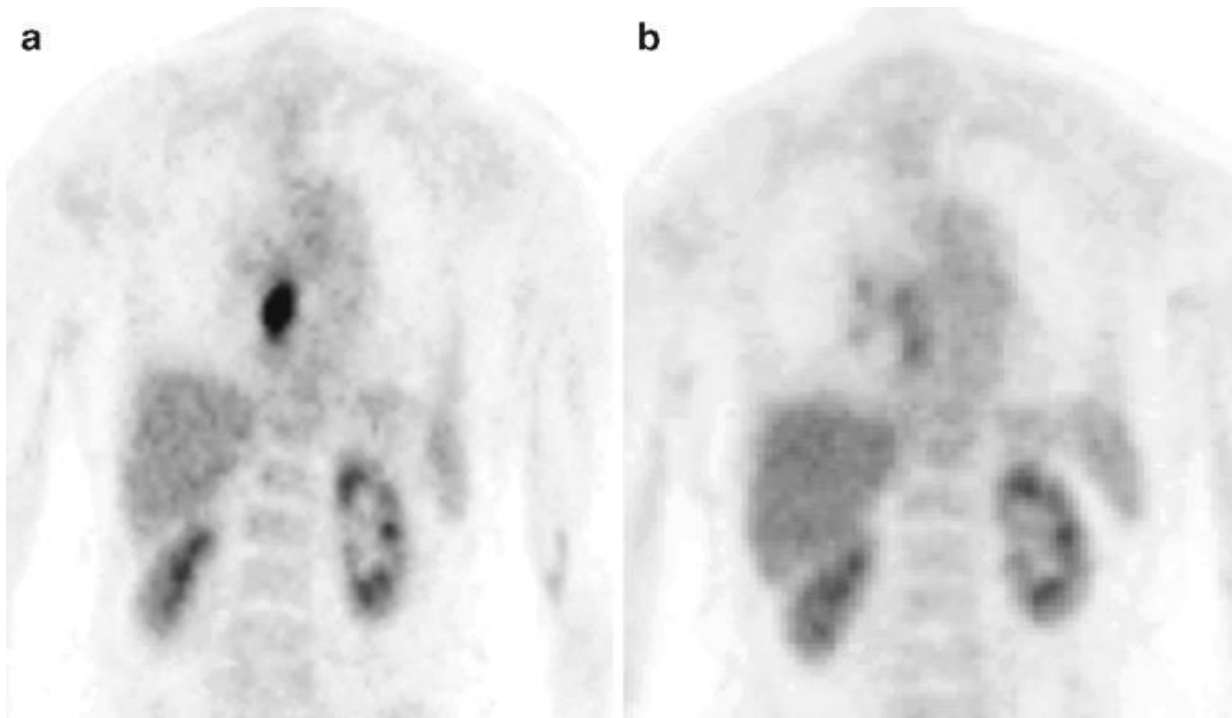
- Hypoechoic
- Ovoid
- Well-defined margins
- Multiple irregular, small and sponge-like anechoic areas with increased doppler signal



Œsophage- Réponse au traitement



Hôpital du Valais
Spital Wallis

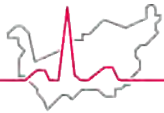


**Avant la chimiothérapie
néoadjuvante**

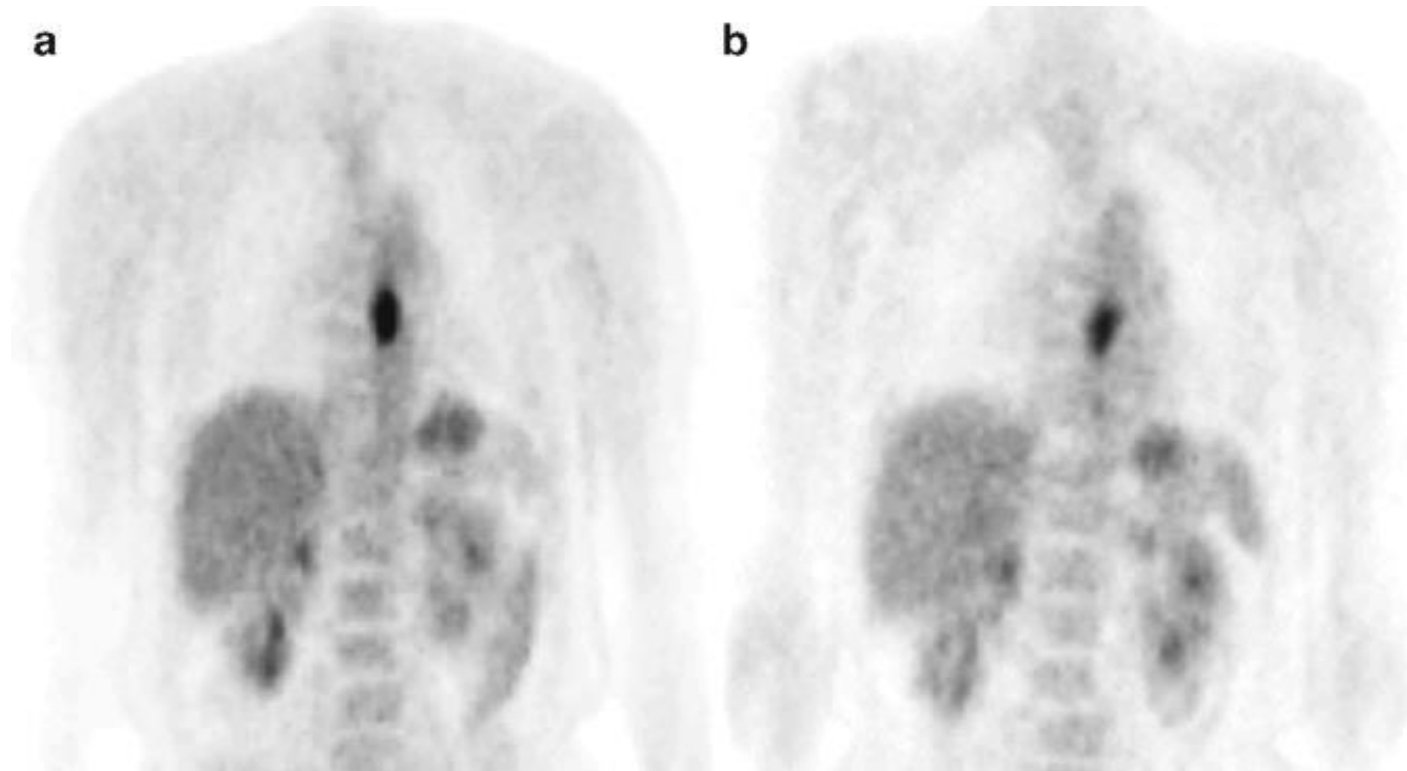
**Après la chimiothérapie
néoadjuvante**

100% réponse au traitement

Œsophage- Réponse au traitement



Hôpital du Valais
Spital Wallis

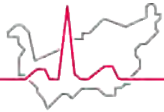


**Avant la chimiothérapie
néoadjuvante**

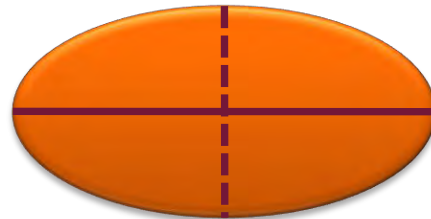
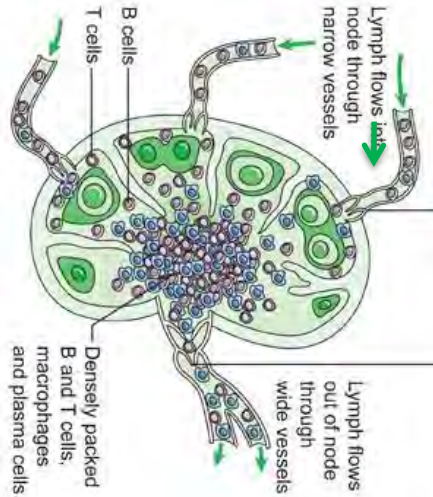
**Après la chimiothérapie
néoadjuvante**

50% réponse au traitement

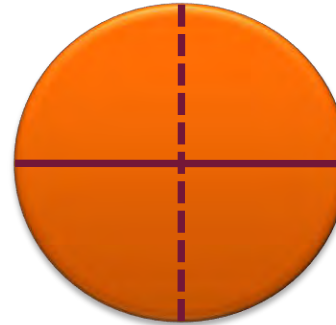
PET/CT & atteinte ganglionnaire



Hôpital du Valais
Spital Wallis



Benign form



Metastatic form



Short-axis



Long-axis

La spécificité de la lecture combinée PET/CT utilisant un rapport short axis/ long axis $> 0,78$ est d'environ 90%

Kamel, work in progress

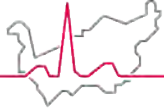
PET/CT & atteinte ganglionnaire



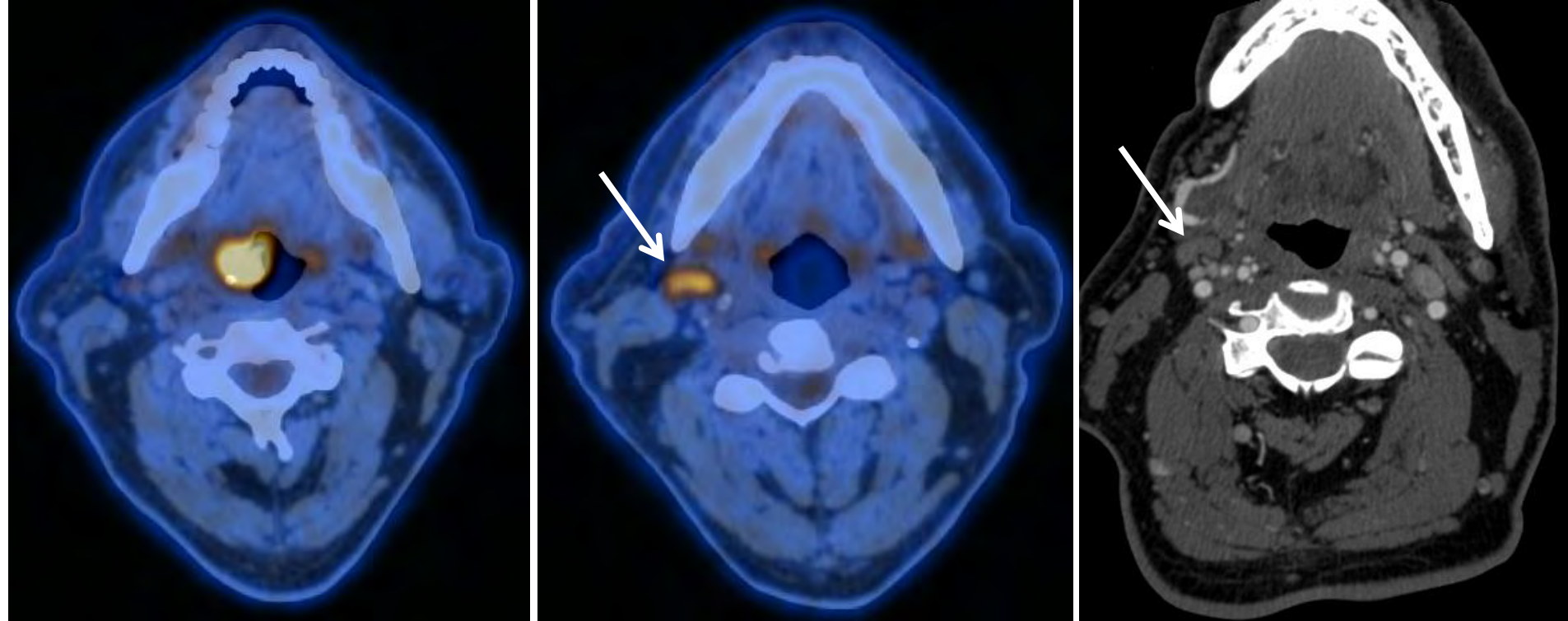
Ganglion lymphatique métastatique de 5 mm chez une patiente atteinte d'un carcinome de la glande salivaire

(short-ax/long-ax = 0.89)

PET/CT & atteinte ganglionnaire

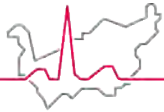


Hôpital du Valais

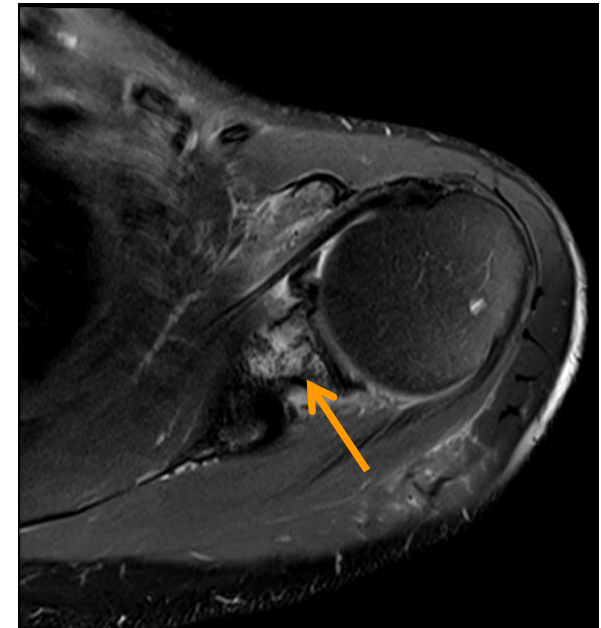
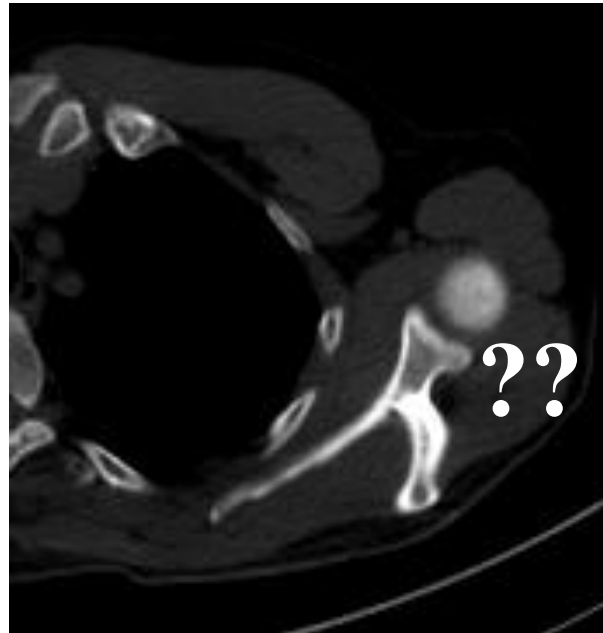
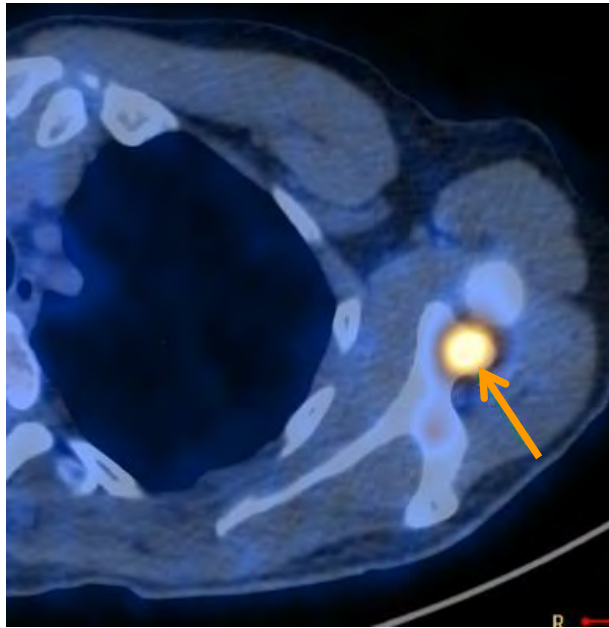


Ganglion cervical inflammatoire chez un patient atteint d'un cancer de l'amygdale
(short-ax/long-ax = 0.35)

PET/CT & métastase à distance

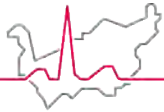


Hôpital du Valais
Spital Wallis

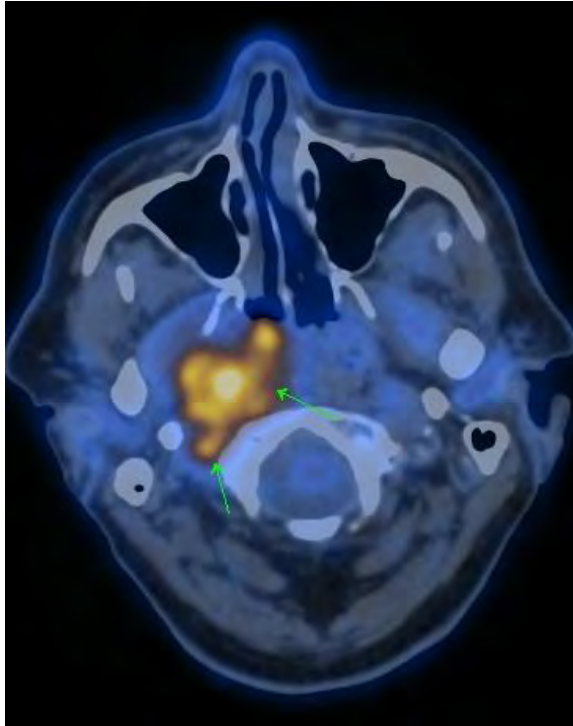


Métastase scapulaire d'un carcinome adénoïde kystique
de la glande salivaire

PET/CT & réponse au traitement



Hôpital du Valais
Spital Wallis



Avant

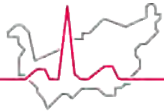


Après

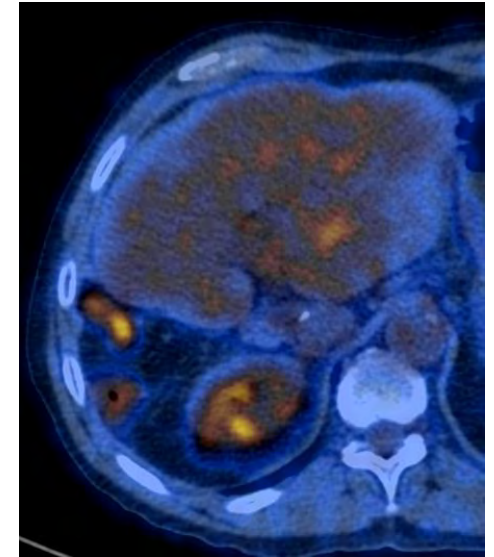
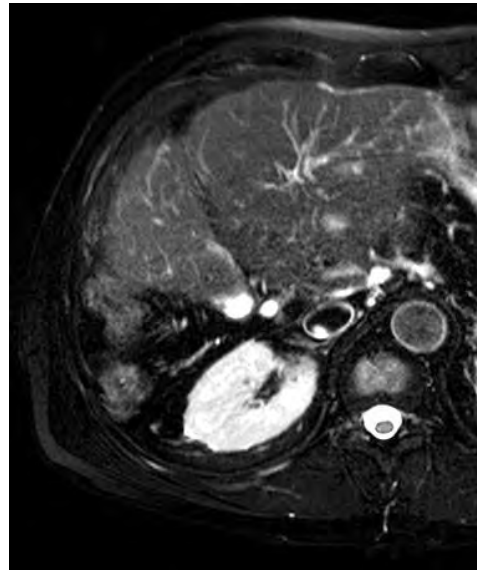
Tumeur peu différenciée à 8 semaines après
la radio-chimiothérapie combinée

Valeur prédictive négative 95%

La marche sur le feu

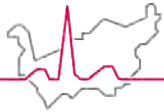


Hôpital du Valais
Spital Wallis

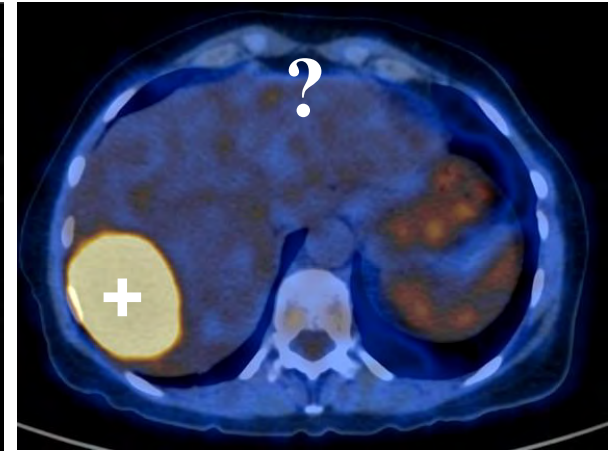
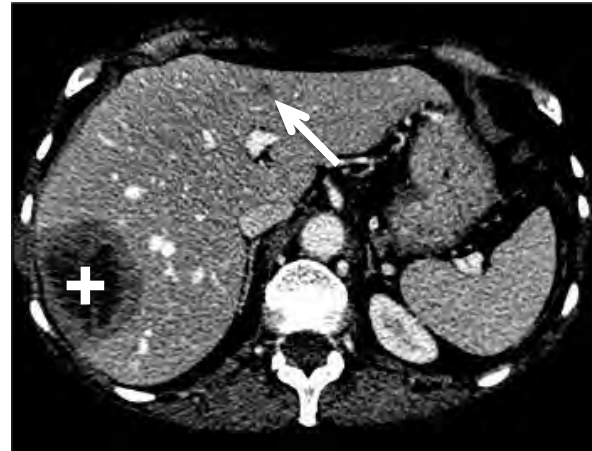
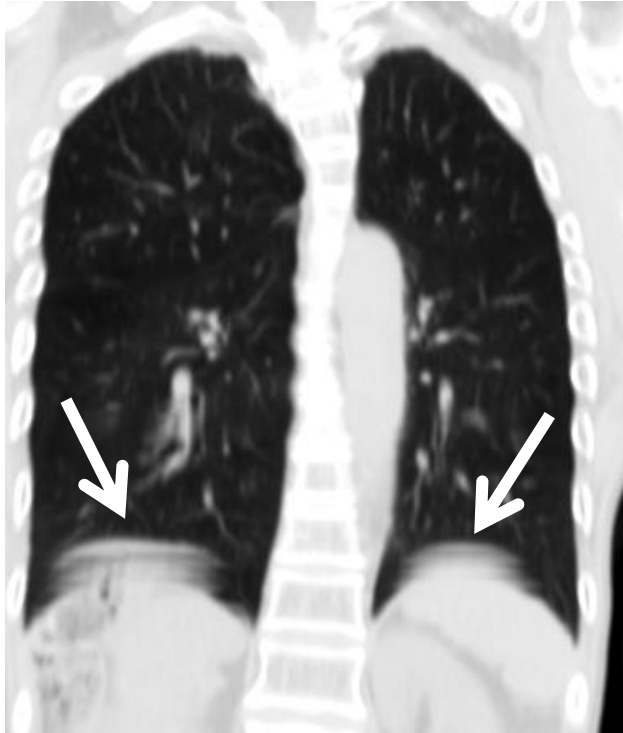


PET/CT du foie

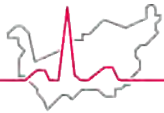
La marche sur le feu



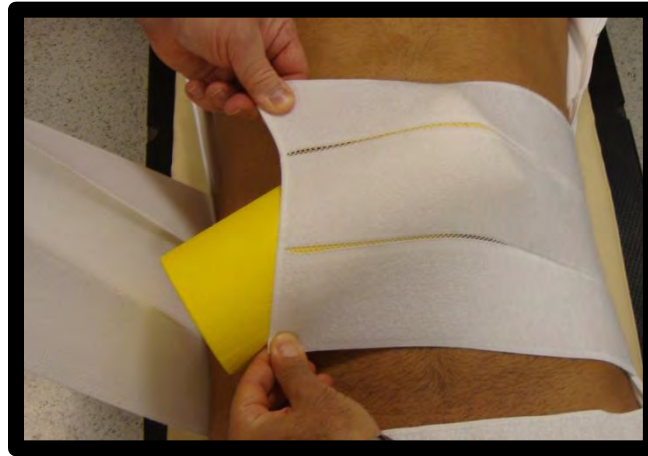
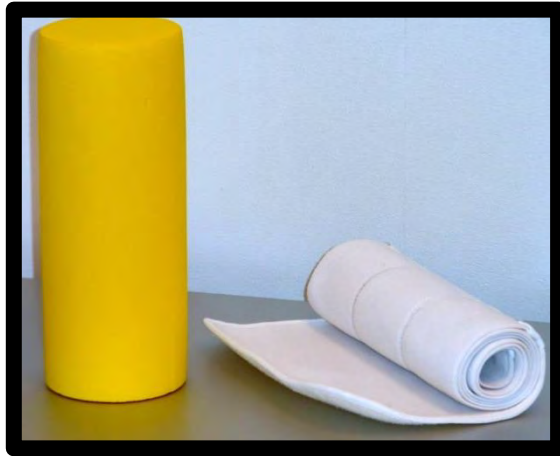
Hôpital du Valais
Spital Wallis



**Le mouvement respiratoire produit en particulier un bruit qui réduit la sensibilité de détection des lésions !!!!!!!!!!!!!!!
(généralement la partie inférieure des poumons et le foie)**

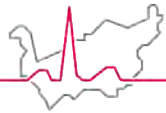


Hôpital du Valais
Spital Wallis



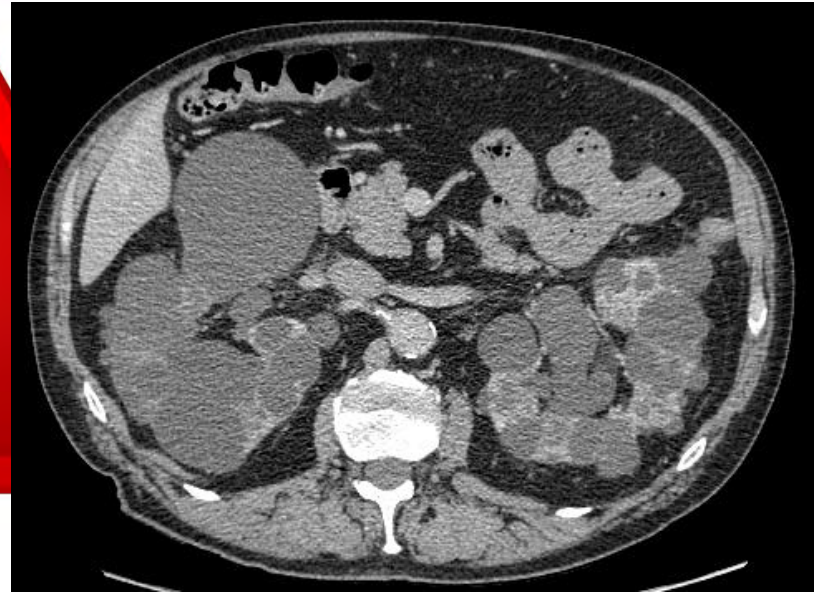
L'épreuve comp de l'hypochondre droit

Kamel EM, et al. SSR 2013

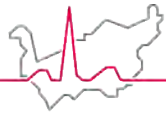


Hôpital du Valais
Spital Wallis

L'épreuve comp

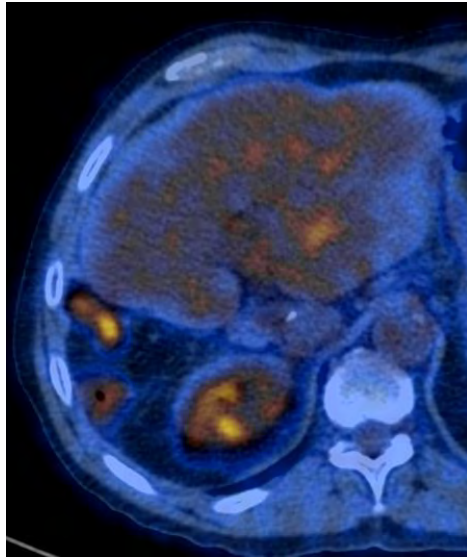
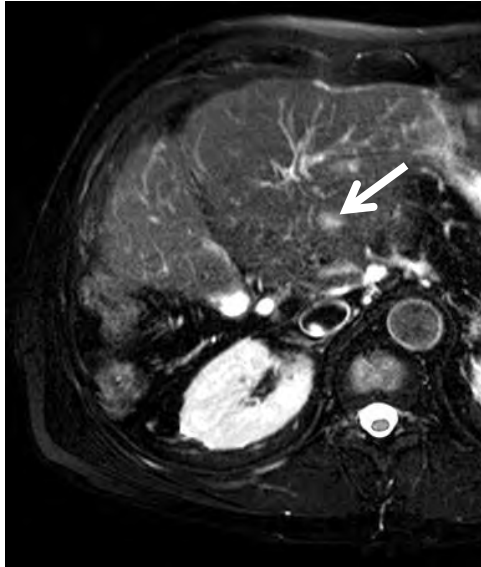


**Patients avec aneurisme abdominal ou lésions
kystiques >3cm**

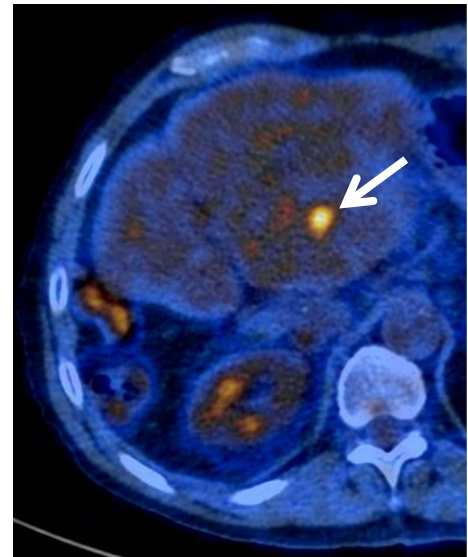


Hôpital du Valais
Spital Wallis

L'épreuve comp

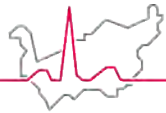


Avant

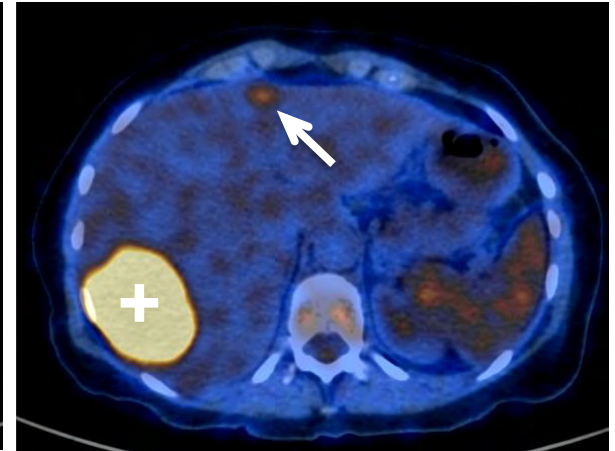
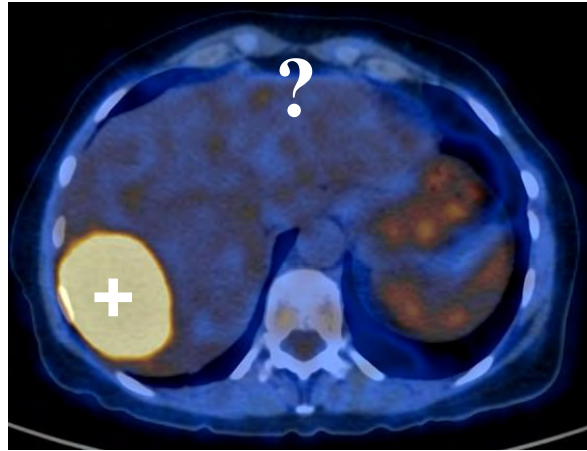
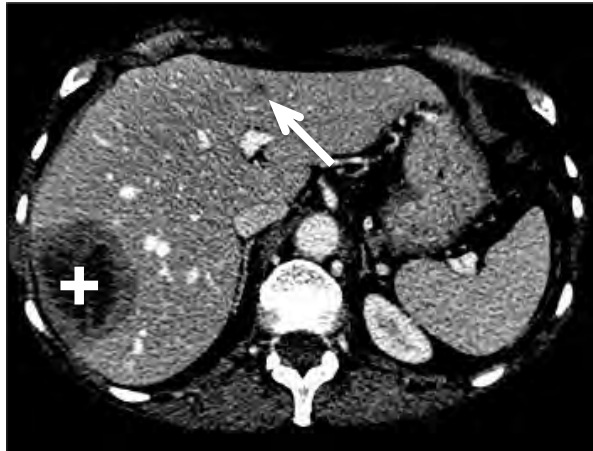


Après

Kamel EM, et al. SSR 2013



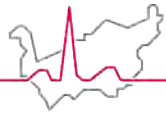
L'épreuve comp



Avant

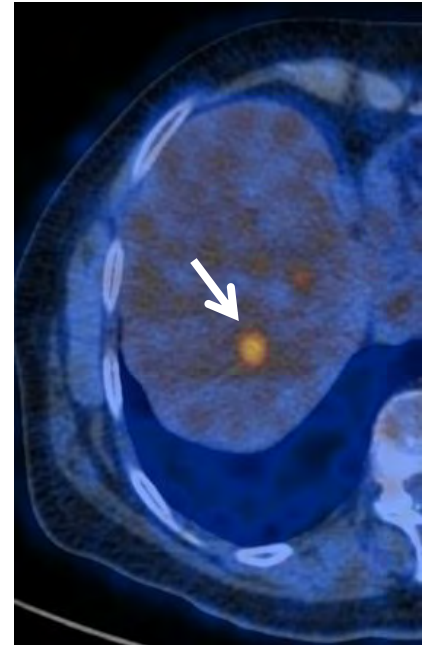
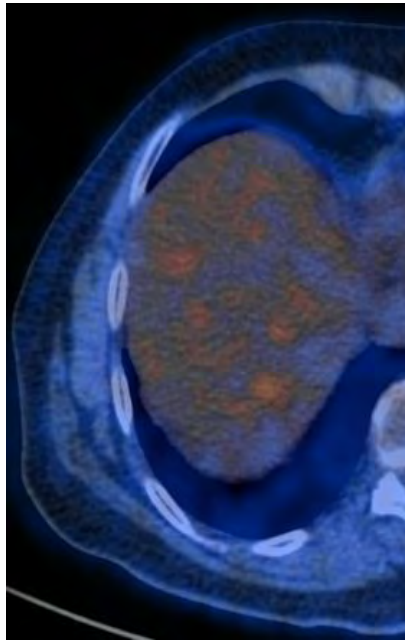
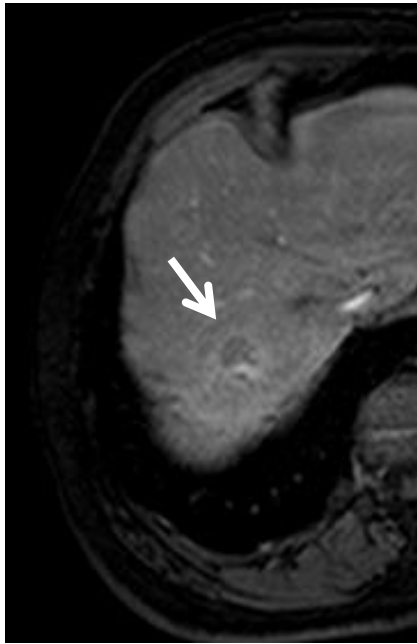
Après

Kamel EM, et al. SSR 2013



Hôpital du Valais
Spital Wallis

L'épreuve comp

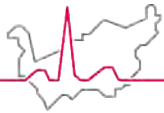


Avant

Après

Kamel EM, et al. SSR 2013

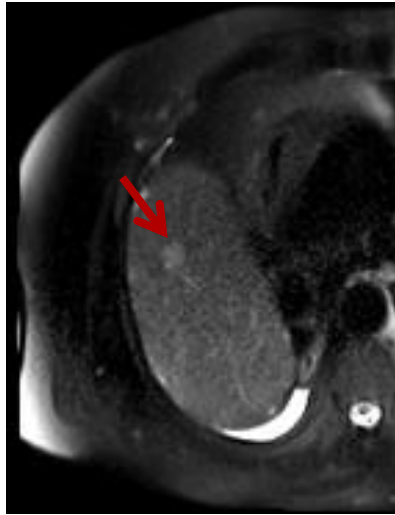
L'épreuve comp



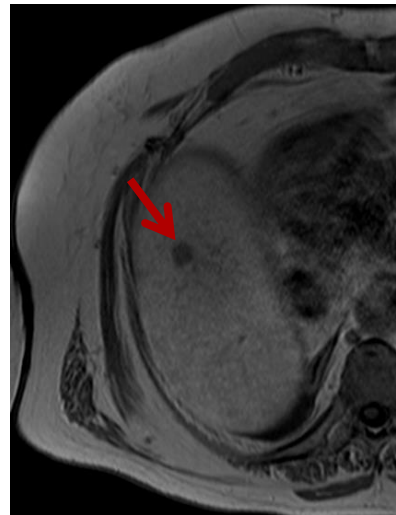
Hôpital du Valais
Spital Wallis



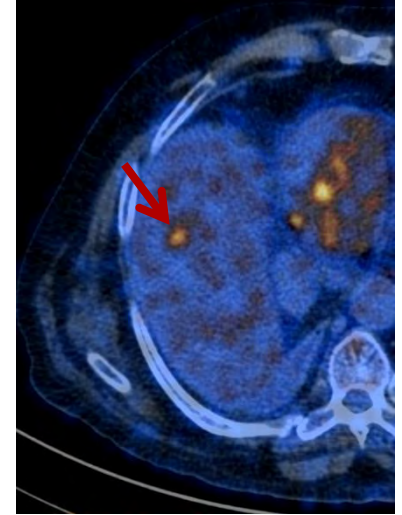
DWI



T2-FSE



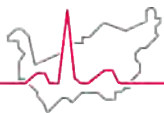
T1 EG HR



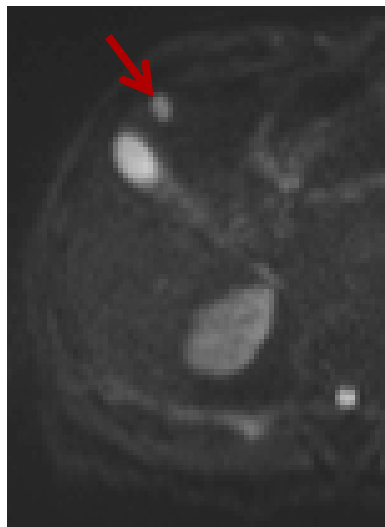
PET/CT

9 mm métastase du foie visible à l'IRM ainsi qu'au PET/CT

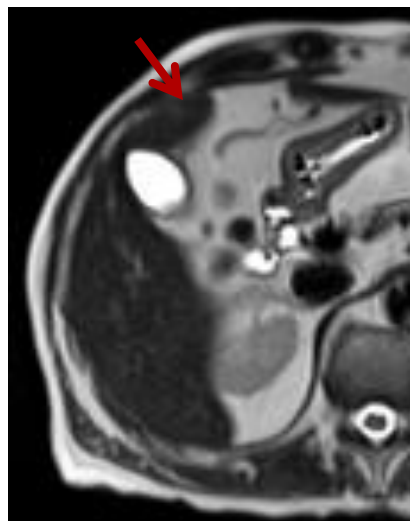
L'épreuve comp



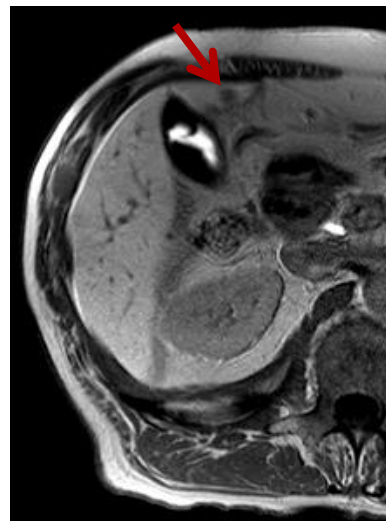
Hôpital du Valais
Spital Wallis



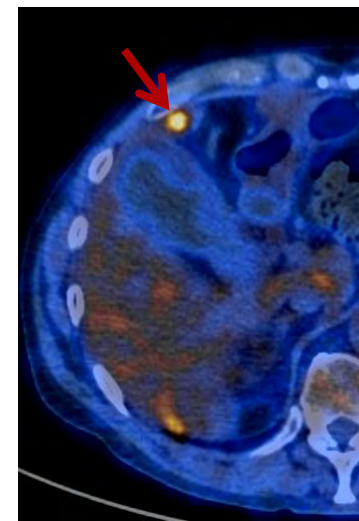
DWI



T2-HASTE

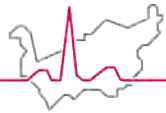


T1 EG HR

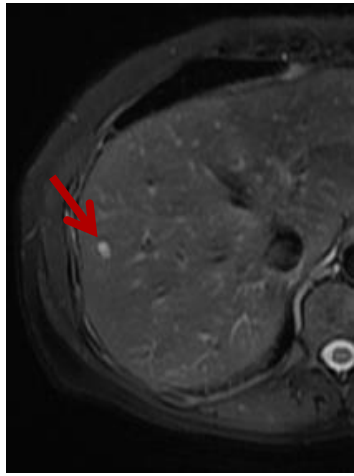


PET/CT

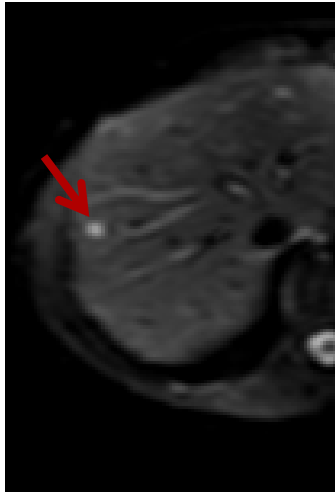
7 mm métastase du foie visible à l'IRM ainsi qu'au PET/CT



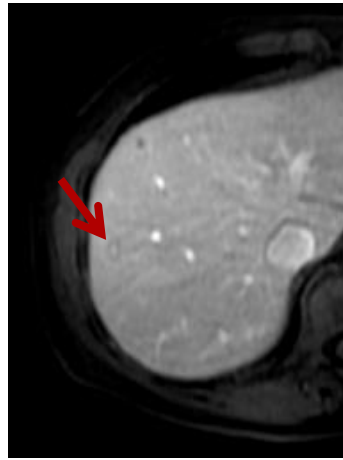
L'épreuve comp



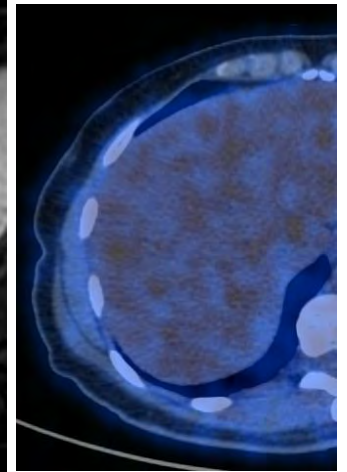
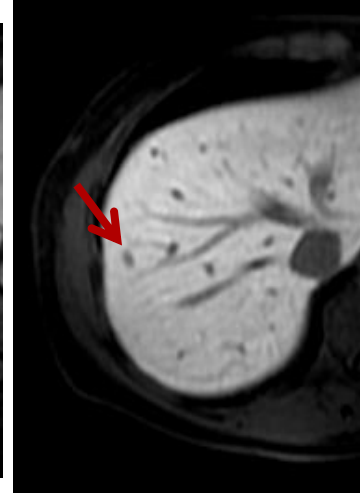
T2-FSE



DWI

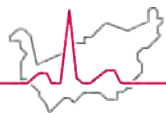


T1-W VIBE



PET/CT

6 mm angiome atypique a été faussement catégorisée
comme lésion métastatique à l'IRM

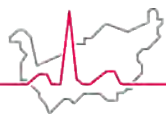


Hôpital du Valais
Spital Wallis

L'épreuve comp

	PET/CT	MRI
Sensitivity	91%	100%
Specificity	100%	89%
PPV	100%	92%
NPV	71%	100%
Accuracy	93%	93%

L'avenir



Hôpital du Valais
Spital Wallis

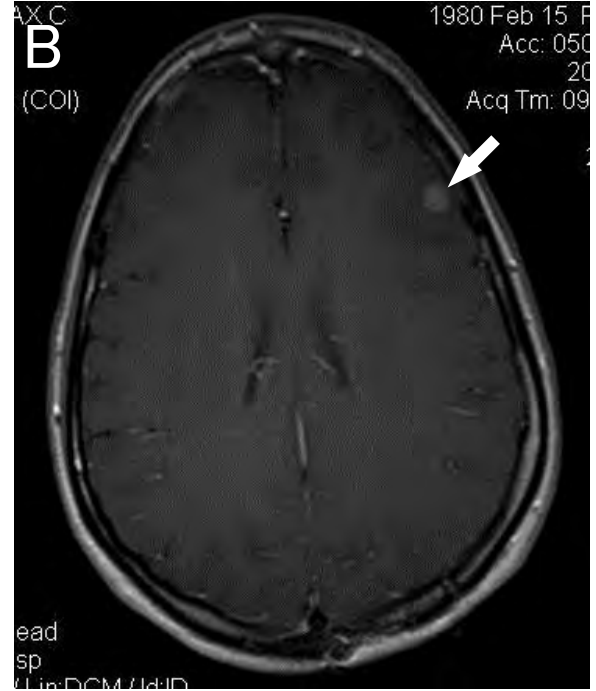


PET/IRM

Point faible

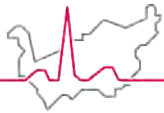


A



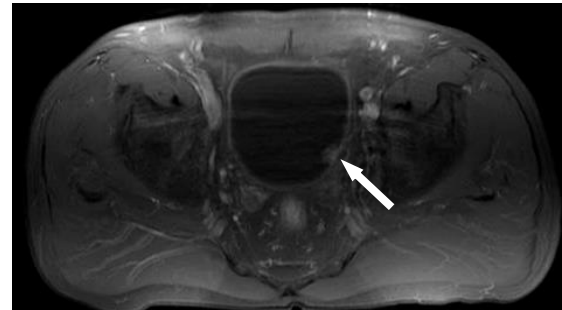
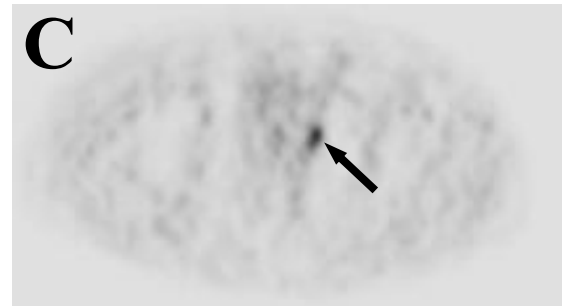
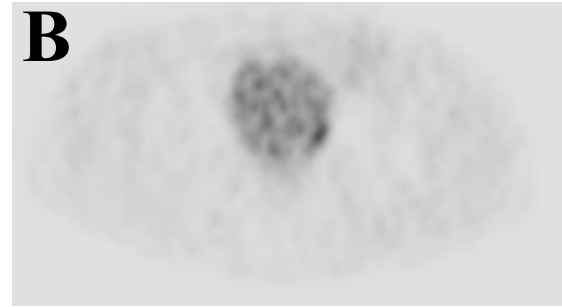
PET sensibilité ~60%

Ancienne Point faible



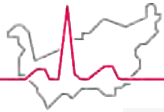
Hôpital du Valais
Spital Wallis

L'excrétion urinaire du ^{18}F -FDG



Kamel, et al. J Nucl Med (2006)

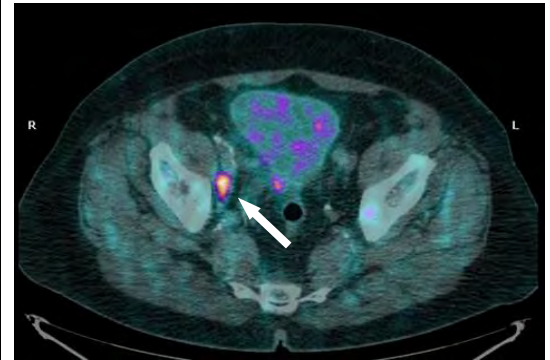
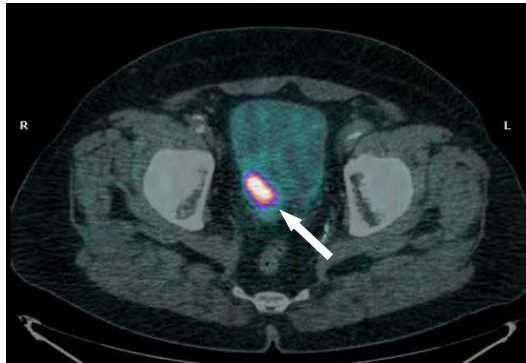
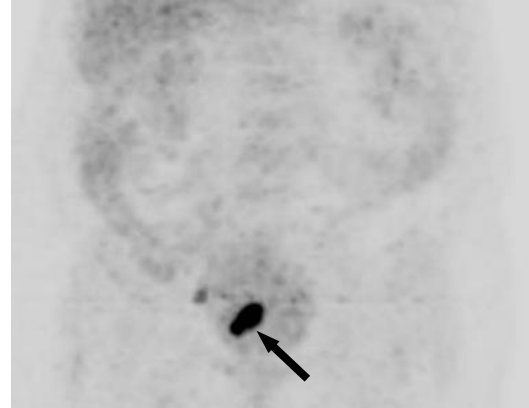
Ancienne Point faible



Hôpital du Val de Spital Wallis

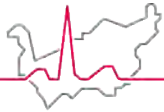


L'excrétion urinaire du 18F-FDG

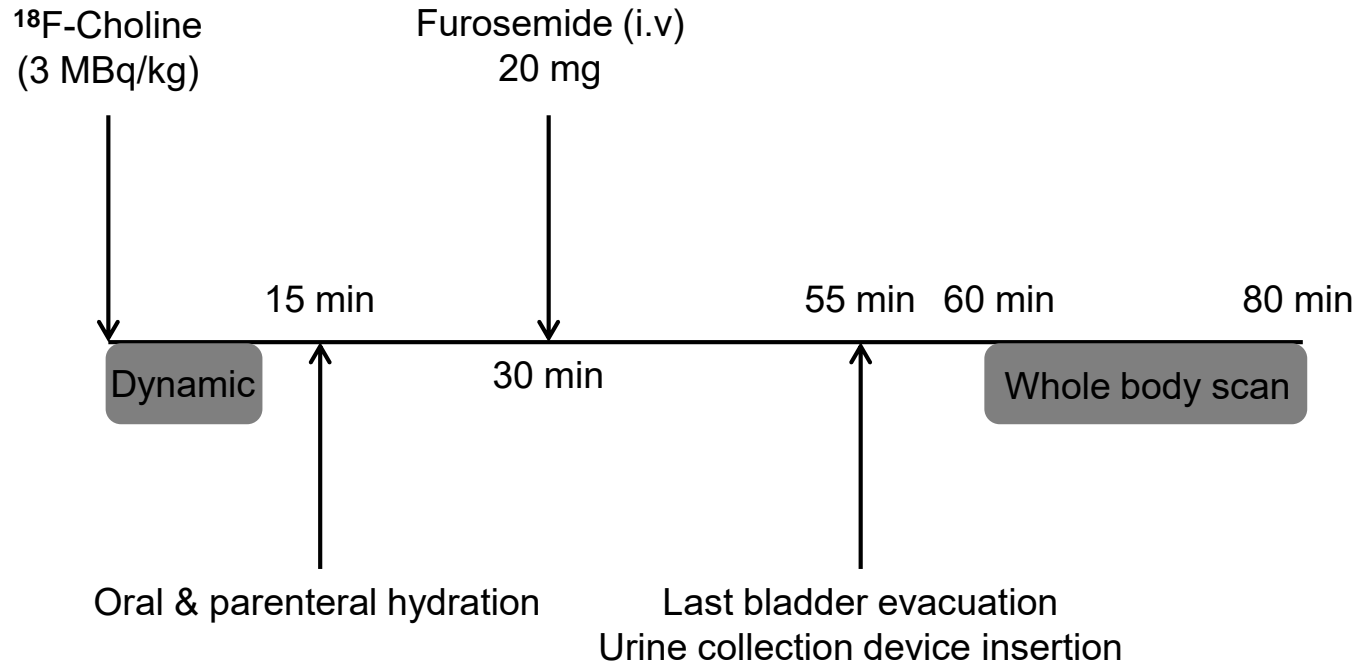


Kamel, et al. J Nucl Med (2006)

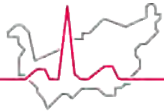
18F Choline PET/CT & les tumeurs de la prostate



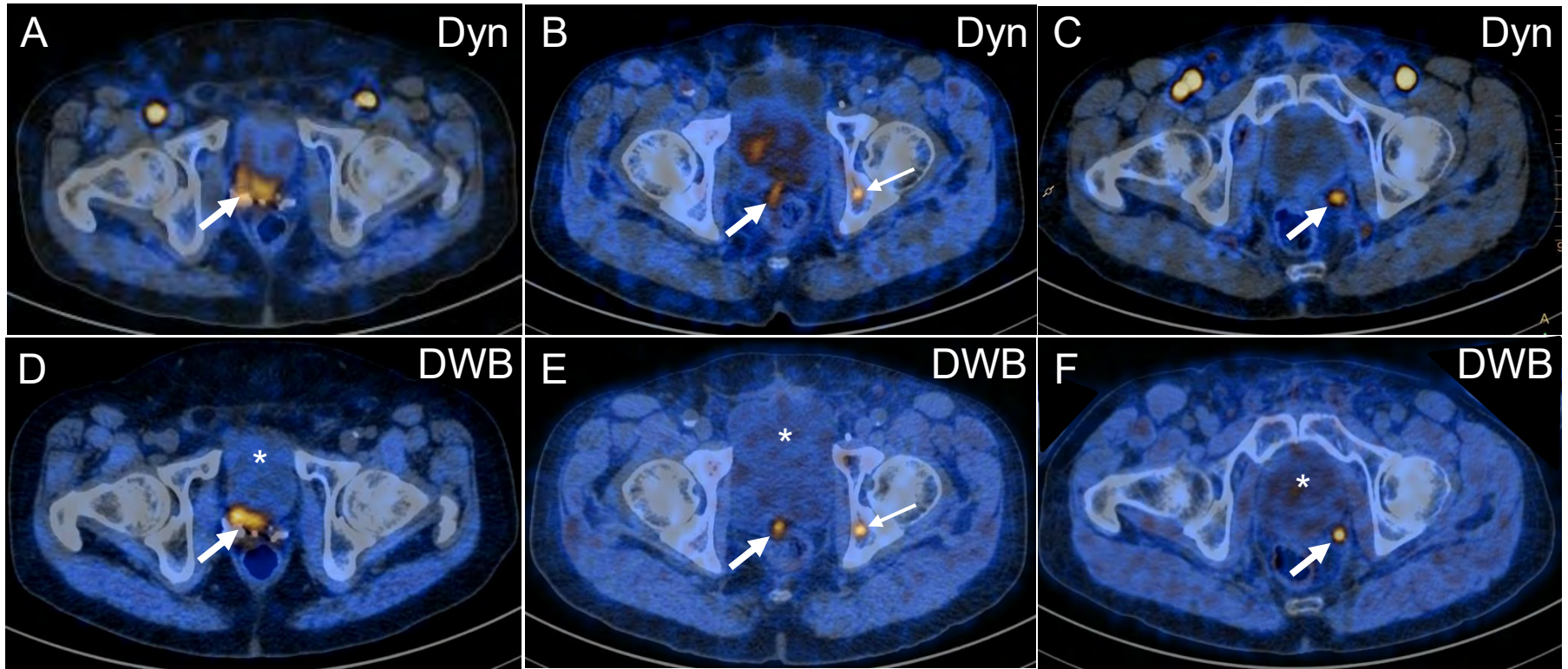
Hôpital du Valais
Spital Wallis



18F Choline PET/CT-recidive locale

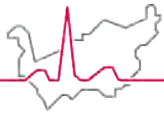


Hôpital du Valais
Spital Wallis

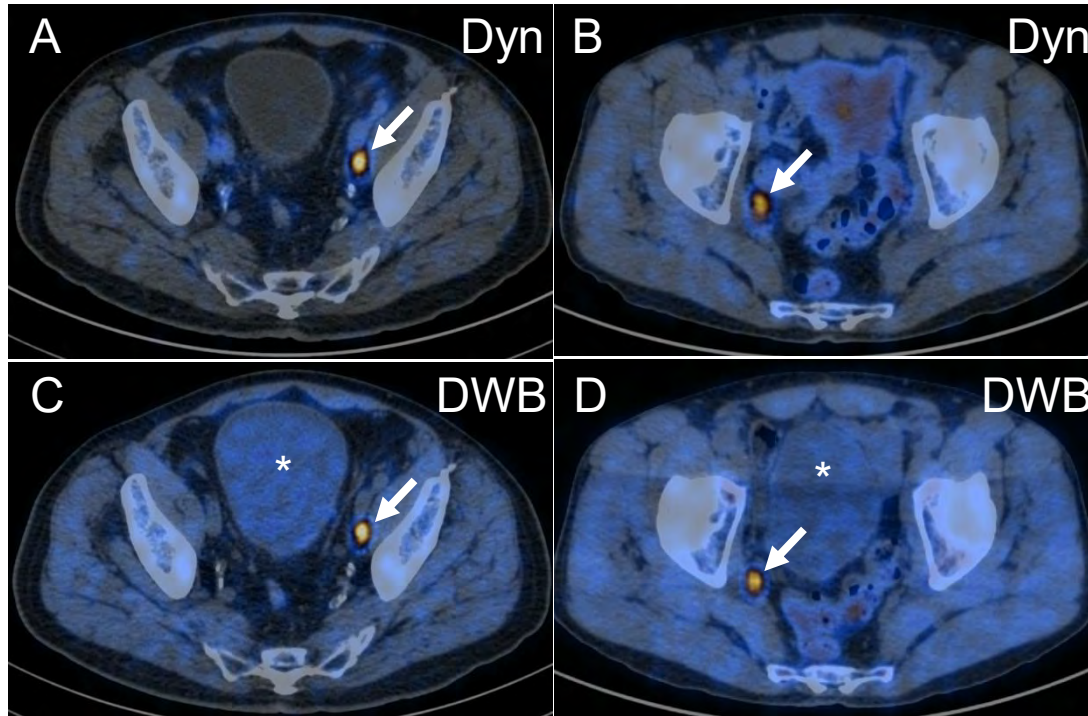


Valeur du PSA ++ post traitement

18F Choline PET/CT-recursive ganglionnaire

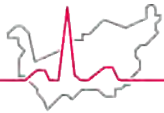


Hôpital du Valais
Spital Wallis

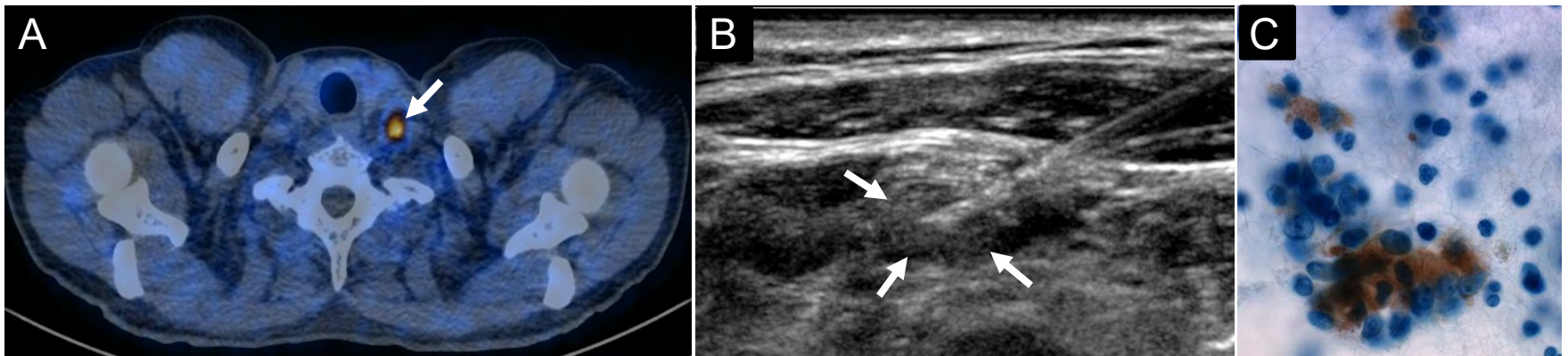


Valeur du PSA ++ post traitement

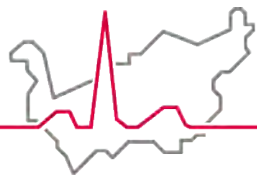
18F Choline PET/CT-recidive ganglionnaire



Hôpital du Valais
Spital Wallis



Valeur du PSA ++ post traitement



Hôpital du Valais
Spital Wallis

Merci pour votre attention