

SUPPLEMENTAL RESULTS

Comparison of ^{18}F -FDOPA PET, ^{123}I -MIBG, and ^{18}F -FDG PET Imaging

In this cohort, there were 17 triplets of ^{18}F -FDOPA, ^{18}F -FDG, and ^{123}I -MIBG imaging. Eleven sets (64.7%) showed concordant results in the three imaging methods, including all positive in 10 histology-proven NTs, and all negative in 1 lesion without tumor cells. ^{18}F -FDOPA and ^{18}F -FDG PET images demonstrated a higher resolution and tumor delineation than ^{123}I -MIBG scintigraphy (Fig. 2A). The remaining 6 discordant triplets (37.3%) included 5 NTs and 1 lesion without viable tumor cells. Among them, one showed MIBG- / FDOPA+ / FDG- (Fig. 2B); four showed MIBG- / FDOPA+ / FDG+ (Supplemental Fig. 2A; including the FDOPA-false positive lesion); and one showed MIBG+ / FDOPA+ / FDG- (Supplemental Fig. 2B). Analysis of the performance of individual imaging methods among these triplets are summarized in the supplemental table. ^{18}F -FDOPA PET demonstrated the highest accuracy in detecting NTs.

^{18}F -FDOPA Uptake, AADC Gene Expression, and Urinary VMA Excretion

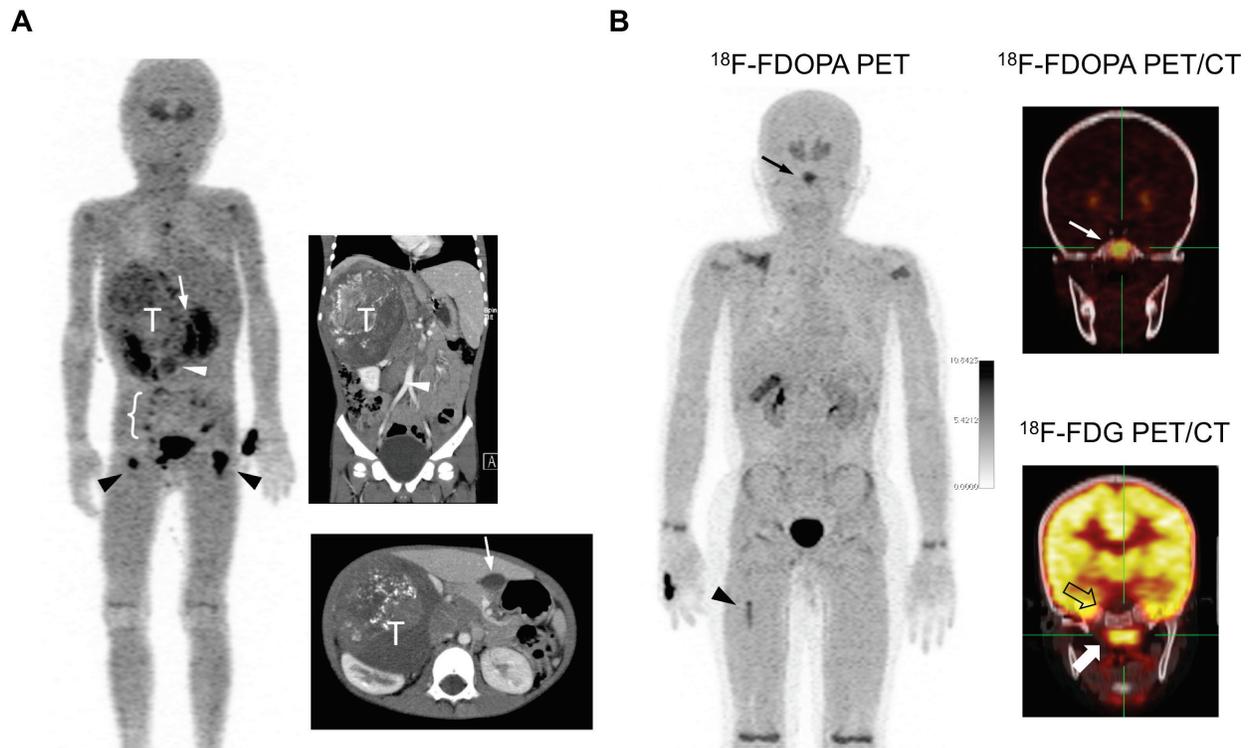
In 47 tumors (39 NTs and 8 lesions without viable tumor cells) with concomitant urinary VMA result, the median VMA level was 2.2 (interquartile range [IQR], 0.92–6.7) mg/day, while their median SUV_{max} was 2.801 (IQR, 1.649–4.996), and their median T/L was 1.982 (IQR, 1.401–3.216). There was a modest and significant correlation between urinary VMA and ^{18}F -FDOPA uptake (SUV_{max} , $\rho=0.3492$, $P=0.0161$; T/L, $\rho=0.4360$, $P=0.0022$; Supplemental Fig. 4A). Tumors with stronger ^{18}F -FDOPA uptake showed significantly higher urinary VMA levels ($P=0.0022$; Supplemental Fig. 4B).

SUPPLEMENTAL TABLE

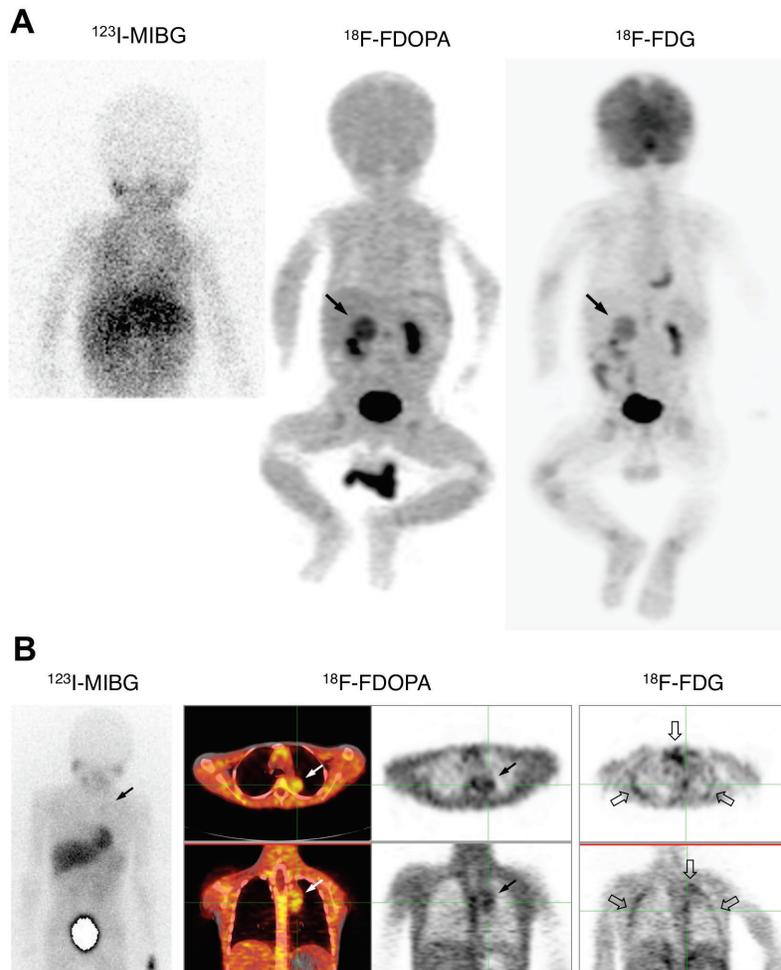
Sensitivity and Specificity of ^{18}F -FDOPA PET, ^{123}I -MIBG Scan, and ^{18}F -FDG PET
in 17 NT Patients with Triplet Images (Including 15 Tumors with Viable Cells)

Modality	Sensitivity (%; 95%CI)	Specificity (%; 95%CI)	Accuracy (%)
^{18}F -FDOPA PET	15/15 (100.0; 78.2–100.0)	1/2 (50.0; 1.26–98.7)	16/17 (94.1)
^{123}I -MIBG scan	11/15 (73.3; 44.9–92.2)	2/2 (100.0; 15.8–100.0)	13/17 (77.4)
^{18}F -FDG PET	13/15 (86.7; 59.5–98.3)	1/2 (62.5; 1.26–98.7)	13/17 (77.4)

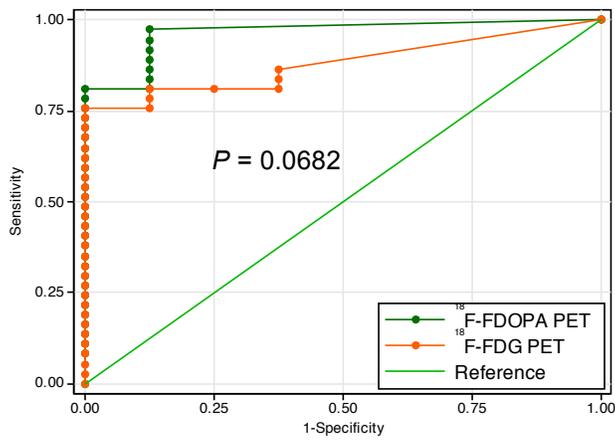
SUPPLEMENTAL FIGURES



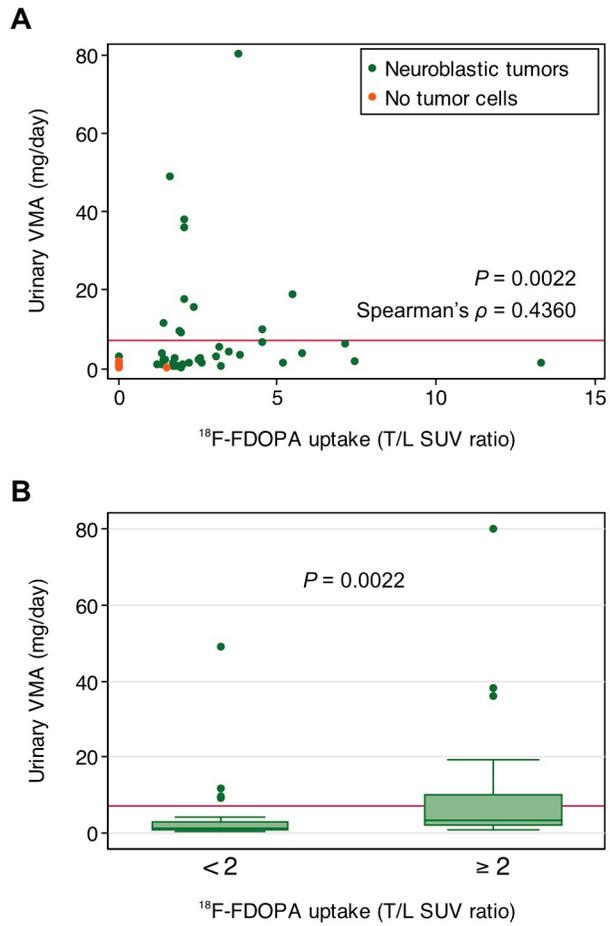
SUPPLEMENTAL FIGURE 1. Abnormal ^{18}F -FDOPA uptake by NTs. (A) A five-year-old boy with stage 4 disease presented with a huge suprenal tumor (T) with heterogeneous ^{18}F -FDOPA uptake pattern, which displaced the gall bladder (white arrow) and kidneys. ^{18}F -FDOPA PET also revealed metastases to paraspinal lymph nodes (brace), paraaortic lymph nodes (white arrow head), and bilateral proximal femurs (black arrow heads). Histology of the main tumor showed poorly differentiated neuroblastoma. (B) A nine-year-old boy with stage 4 neuroblastoma after multimodality therapy for 3 years was revealed with a metastatic lesion at the sphenoid bone on ^{18}F -FDOPA PET (arrow). The lesion was negative on ^{18}F -FDG PET (open arrow), while there was strong uptake by the brain and nearby pharyngeal lymphoid tissue (thick arrow). The concurrently abnormal ^{18}F -FDOPA uptake at right femoral shaft (arrow head) was proven to be a metastatic neuroblastoma on curettage.



SUPPLEMENTAL FIGURE 2. (A) A three-month-old boy with stage 2 disease showed MIBG- / FDOPA+ / FDG+ over the right adrenal gland at diagnosis. Histology showed poorly differentiated neuroblastoma. (B) A five-year-old girl with benign ganglioneuroma in the mediastinum showed MIBG+ / FDOPA+ / FDG-. Note the bilateral pleural uptake of ^{18}F -FDG (open arrows), which was suspected to be physiologic uptake.



SUPPLEMENTAL FIGURE 3. Receiver operating characteristic analysis of ¹⁸F-FDOPA PET and ¹⁸F-FDG PET.



SUPPLEMENTAL FIGURE 4. Relationship between tumor uptake of ^{18}F -FDOPA and urinary VMA (n=47; reference line, upper limit of VMA).