Online Supplemental Data

CT Imaging Techniques

A 64-slice multi-detector CT scanner (Aquilion One, Canon Medical Systems, Otawara, Japan) employed the following protocol: 120 kV, 150 mA, matrix 512×512, 0.5 s/rotation, section thickness of 0.5 mm, a field of view (FOV) of 220 mm^2. The contrast-enhanced scan was performed 60-80 seconds after the intravenous administration of Iopromide (1.5 ml/kg body weight; iodine concentration, 300 mg/mL; Bayer Company, Germany). The CT scan generally included the area from the calvarium to the clavicle to cover the whole lesion (the same for MRI).

MR Imaging Techniques

All MR images were acquired using a 3.0-T MR system (Trio Tim; Siemens, Erlangen, Germany) with a head-and-neck coil. The baseline MR imaging included T1-weighted fast spin-echo images in the axial, coronal and sagittal planes, T2-weighted fast spin-echo MR images in the axial plane and a spin-echo echo-planar DWI sequence. After the intravenous administration of gadopentetate dimeglumine (0.2 mmol/kg body weight; Magnevist, Schering, Berlin, Germany), axial and sagittal T1-weighted spin-echo sequences and coronal T1-weighted fat-suppressed spin-echo sequences were performed sequentially using the same parameters as applied before the injection.

PET/CT Imaging Techniques

The PET/CT scanner systems were GEMINI GXL (Philips Medical System, Cleveland, OH). All patients fasted for at least 6 h and presented a blood glucose level <150 mg/dl. PET/CT was performed. Images were performed 60 minutes after the injection of approximately 5 MBq/kg of FDG (IBA Molecular Imaging, Saclay, France). At the time of tracer injection, all patients were in optimal hydration state (i.v. administration of 500 ml of saline solution). The CT scan was obtained first in the craniocaudal direction using a whole-body protocol. The CT scan followed standard parameters: transverse field of view of 700 mm, collimation of 16×1.2 mm, pitch = 1, tube voltage of 120 kV, and effective tube current of 80 mAs. PET images were acquired in the craniocaudal direction using a whole-body protocol (3 minutes per step), reconstructed using an ordered subset expectation maximization (OSEM) algorithm, and finally smoothed with a Gaussian filter (full-width at half-maximum = 2 mm).

Online Supplemental Video. The real-time process of the US/CT fusion-guided biopsy (patient No. 10). After successful registration, the CT images *(left)* are coordinated and moved simultaneously with real-time US scanning; a heterogeneous low-echoic lesion can be identified and located on US *(right)*. The dashed line indicates the planned needle path via the paramaxillary approach. The needle can be monitored in real time during the biopsy process.

Online Supplemental Table. Clinical characteristics, procedural details, pathological results and managements of patients

No.	sex	Age (years)	Chief complaint	Lesion		Fusion modality	Needle		Complication	Pathological diagnosis of core needle biopsy	Management
				size (cm)	location*		approach	Number of passes			
1	M	27	Swelling	6.5	ITF	CT	SM	2	No	Solitary fibrous tumor	Radical surgery
2	F	58	Asymptomatic	2.2	PPS	MR	RM	2	No	Schwannoma	Median term follow-up
3	F	30	Swelling, pain, and dizziness	3.2	ITF	CT	SZ	2	No	Meningeoma	Short term follow-up
4	F	43	Tinnitus	4.0	ITF	CT	PM	2	No	Invasive meningeoma	Short term follow-up
5	M	76	Swelling	4.5	PPS	CT	RM	3	No	Warthin tumor	Median term follow-up
6	M	16	Swelling	3.9	PPS	CT	SM	2	Minor inflammation	Lymphatic malformation	Median term follow-up
7	F	50	Swelling, pain, and hoarseness	4.1	PPS	CT	SM	2	No	Pleomorphic adenoma	Radical surgery
8	M	30	Aural fullness and hearing loss	4.3	PPS	CT	SM	3	No	Schwannoma	Short term follow-up
9	F	59	Swelling	3.8	PPS	CT	SZ	3	No	Nondiagnostic	Radical surgery
10	F	32	Aural fullness, tinnitus, and hearing loss	2.8	PPS	CT	PM	3	Minor bleeding	Lymphatic malformation	Local sclerotherapy
11	F	59	Swelling	6.5	PPS	CT	RM	3	No	Acinic cell carcinoma of the parotid gland	Radical surgery
12	F	64	Facial palsy and dysphagia	2.2	SB	MR	RM	3	No	Squamous cell carcinoma	The patient refused further treatments
13	F	58	Tinnitus	2.3	SB	MR	RM	2	No	Paraganglioma	Short term follow-up
14	M	39	Headache	3.7	ITF	PET-CT	SZ	3	No	Nasopharyngeal carcinoma	Radiotherapy and chemotherapy
15	F	50	Dizziness and tinnitus	2.7	SB	MR	RM	2	No	Meningeoma	Short term follow-up
16	F	39	Asymptomatic	2.8	PPS	CT	RM	3	No	Schwannoma	Radical surgery

Note.— M=male, F=female, PPS= parapharyngeal space, ITF=infratemporal fossa, SB=skull base, SZ=subzygomatic, RM=retromandibular, PM=paramaxillary, SM=submandibular.

* the lesion location refers to the center of the lesion.