TABLES

Imaging Modalities Evidence Tables

Table 1 Computed Tomography (CT) Imaging

Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Clark (1986)[9]	Reformatted sagittal images in the differential diagnosis of meningiomas and pituitary adenomas with suprasellar extension.	Clinical experience using coronal reformatted image to discriminate between NFPA and meningiomas.	>100	Diagnostic/ III	Reformatted sagittal images can be used in the differential diagnosis between pituitary tumors with suprasellar extension and meningiomas located in this area.
Chen (1982)[10]	Computed tomography in the diagnosis of pituitary adenoma.	Clinical experience using CT in the diagnosis of pituitary lesions.	85	Diagnostic/ III	There was an abnormal suprasellar cistern in 79. Specifically, the suprasellar cistern was obliterated in 10 cases and had a filling defect in 60 cases. Contrast increases the density of the lesion in 97.6%. The majority of shape of the tumor is round or oval-shaped, sometimes lobulated.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Daniels (1981)[11]	Differential diagnosis of intrasellar tumors by computed tomography.	Patients with pituitary adenomas and other sellar/parasellar lesions underwent CT imaging. CT imaging findings including calcifications and low density regions were compared between the different groups of pathologies.	25	Diagnostic/ III	Calcification was a feature of intrasellar meningiomas, aneurysms, and craniopharyngiomas, but not a typical feature of adenomas. Low-density regions representing necrosis or cyst were found in most types of intrasellar tumors. Eccentricity, hyperostosis, and bone destruction were useful signs of aneurysm, meningioma, and metastasis, respectively. Since adenoma cannot always be distinguished from another intrasellar mass, angiography to demonstrate tumor angioarchitecture may be needed to characterize some neoplasms or to confirm an intrasellar aneurysm.
Robertson (1981)[12]	Trends in the radiological study of pituitary adenoma.	Clinical experience using CT for studying pituitary adenomas.	>20	Diagnostic/ III	CT has limited utility in the definitive diagnosis of pituitary lesions.
Gardeur (1981)[13]	CT analysis of intrasellar pituitary adenomas with emphasis on patterns of contrast enhancement.	Patients with pituitary adenomas underwent CT imaging. CT imaging characteristics found in this cohort are described.	85	Diagnostic/ III	Twenty-eight of 85 adenomas exhibited homogeneously increased density. Twenty exhibited heterogeneously increased, patchy, or ringlike density; 16, hypodensity; and 8, isodensity with normal pituitary tissue. In 13 patients, the predominant CT finding was an empty sella with variable enhancement of the adenoma and residual pituitary tissue. CT can visualize adenomas, although there are variations in their appearance.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Macpherson (1981)[14]	Radiological differentiation of intrasellar aneurysms from pituitary tumors.	Patients with pituitary adenomas or intrasellar aneurysms underwent CT imaging. Imaging characteristics were compared between the 2 groups of pathologies to identify characteristics diagnostic of each pathology.	35	Diagnostic/ III	A completely eroded area of bone, a completely eroded fossa, a soft tissue opacity in the sphenoid sinus, bilateral displacement of the cavernous sinuses and, on CT, general enlargement of the fossa were seen only with cases of pituitary tumor. CT provides radiologic signs specific to pituitary adenomas.
Hatam (1979)[15]	Diagnosis of sellar and parasellar lesions by computed tomography.	Clinical experience using CT for definitive diagnosis of pituitary lesions.	13	Diagnostic/ III	Pituitary adenomas had higher or equal attenuation relative to brain and had contrast enhancement. These differences can aid in CT based visualization/identification of pituitary adenomas.
Gyldensted (1977)[16]	Computed tomography of intra- and juxtasellar lesions. A radiological study of 108 cases.	Clinical experience using CT and angiography for definitive diagnosis of pituitary lesions.	37	Diagnostic/ III	CT is superior to angiography for the diagnosis of pituitary adenomas.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Numaguchi (1981)[17]	Neuroradiological manifestations of suprasellar pituitary adenomas, meningiomas, and craniopharyngiomas.	Patients with pituitary adenomas and other sellar/parasellar lesions underwent CT imaging, skull radiography, and metrizamide cisternography. The various imaging modalities were evaluated for use in diagnosis of each of these pathologies.	16	Diagnostic/ III	The differentiation of different sellar tumors is possible with skull radiography, CT, and cisternography are used. Metrizamide cisternography may be used when the tumor contours are obscure using PIA, or when the differential diagnosis is uncertain after CT.
Hall (1980)[18]	Metrizamide cisternography in pituitary and juxtapituitary lesions.	Patients with pituitary adenomas underwent metrizamide cisternograms. The imaging characteristics are described.	50	Diagnostic/ III	The technique accurately delineates a suprasellar extension of a small or moderate-sized pituitary lesion and usually shows its relationship to the optic chiasm. Large suprasellar masses, however, are not well visualized. Metrizamide cisternography can provide supplemental information relevant to diagnosis of pituitary tumors and is simpler to perform and often better tolerated by patients than is pneumoencephalography.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Davis (1985)[19]	CT-surgical correlation in pituitary adenomas: evaluation in 113 patients.	Patients with nonfunctioning pituitary adenomas and secretory adenomas underwent CT imaging. Imaging characteristics were compared between the groups of different pathologies.	17	Diagnostic / III	The 51 functioning and nonfunctioning macroadenomas had similar CT appearances. Only 34 secretory adenomas presented as discrete, focal, hypodense lesions; the rest were isodense with the adjacent pituitary gland. Secretory adenomas were clinically apparent earlier, and, accordingly, the abnormalities seen on CT were less developed. The location of the normal pituitary gland could not be determined by attenuation characteristics; only by infundibulum displacement or opposite to a discrete, focal, hypodense lesion could the gland location be predicted reliably. Adenomas with hemorrhage, infarction, and cyst formation were indistinguishable from those without these findings. CT was helpful in identifying the mass effect of macroadenomas. CT has value in preoperative evaluation of pituitary adenomas, although differentiation of secretory or nonsecretory is not reliable.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Sakoda (1981)[20]	CT scan of pituitary adenomas.	Patients with nonfunctioning pituitary adenomas and secretory adenomas underwent CT imaging. CT imaging characteristics including enhancement patterns and cystic component identification were compared between the different groups of pathologies.	17	Diagnostic/ III	The absorption coefficient on contrasting enhanced CT does not identify the specific type of adenoma. Ring-like enhancement was observed in 5 nonfunctioning and 4 PRL-secreting adenomas with suprasellar extension, while cystic components were observed in 4 nonfunctioning and 4 PRL-secreting adenomas. CT scans can visualize both secretory and NFPAs but cannot reliably distinguish between them by radiologic parameters.
Hamid (2008)[22]	Anatomic variations of the sphenoid sinus and their impact on trans-sphenoid pituitary surgery.	Patients with pituitary adenomas had both CT and MR imaging retrospectively evaluated. Different anatomical variations of the sphenoid sinus are described.	296	Prognostic/ III	A highly pneumatized sphenoid sinus may distort the anatomic configuration. CT scans can reliably identify this. The combination of CT and MRI in patients with pituitary adenomas can reliably identify anatomical variations of the sphenoid sinus, which has significant effects on surgical approach.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Miki (2007)[23]	Evaluation of pituitary macroadenomas with multidetector-row CT (MDCT): comparison with MR imaging.	Patients underwent multidetector-row CT and conventional MR imaging. Both modalities were evaluated in regard to clarity of tumor margins, identification of normal pituitary gland, identification of erosion or destruction of the sellar floor, and visualization of the adjacent optic pathways.	33	Prognostic/ III	MDCT more clearly demonstrated the lateral tumor margin than MR imaging (*P* = .002). No significant differences in visualization of the normal pituitary gland were noted between MDCT and dynamic MR imaging (*P* = .7). MDCT more clearly demonstrated sellar floor erosion or destruction at the sphenoid sinus than MR imaging (*P* < .001). MR imaging was superior to MDCT for visualizing the adjacent optic pathways (*P* < .001). MDCT is superior to MR imaging for assessing lateral tumor margin and the sellar floor at the sphenoid sinus. MDCT offers useful preoperative information in addition to that obtained from MR imaging.
Abe (2002)[24]	Evaluation of pituitary adenomas by multidirectional multislice dynamic ct.	Clinical experience using multidirectional, multi-splice dynamic CT for visualization of NFPA.	13	Prognostic/ III	The MSDCT-MPR provided the information needed for surgery with good image quality in patients with pacemakers.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Lundin (1991)[25]	Comparison of MR imaging and CT in pituitary macroadenomas.	Clinical experience comparing the utility of MR and CT in the study of pituitary lesions.	65	Prognostic/ III	MR was superior to CT except in the demonstration of bone changes and tumor calcification. The superiority of MR was most pronounced regarding cavernous sinus invasion, tumor relationship to the carotid arteries and optic chiasm, and tumor hemorrhage. Extensive bone changes were visualized with both methods; erosions were often seen only with CT. It is concluded that MR is the preferable method for evaluation of pituitary macroadenomas. CT is useful as a supplementary modality when detailed information on bone anatomy is required, particularly if a transsphenoidal surgical approach is contemplated.
Wu W, (1995)[26]	Pituitary microadenoma. MR appearance and correlation with CT.	Clinical experience comparing the utility of MR and CT in the study of pituitary lesions.	20	Prognostic/ III	MR is more sensitive in detection of pituitary lesions, whereas CT is more sensitive to detect sellar floor erosions.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Johnson MR, (1992)[27]	The evaluation of patients with a suspected pituitary microadenoma: Computer tomography compared to magnetic resonance imaging.	Clinical experience comparing the utility of MR and CT in the study of pituitary lesions	25	Diagnostic / III	MRI is superior to CT in the assessment of pituitary lesions.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Kaufman (1987)[28]	Large pituitary gland adenomas evaluated with magnetic resonance imaging.	Clinical experience using MR for the assessment of NFPAs.	15	Prognostic/ III	Bone destruction and tumor calcification were better detected by CT scanning than by MRI. MRI was as effective as CT scanning in detecting a cyst or variation in tumor consistency. Neither MRI nor CT scanning was capable of distinguishing specific tumor types. In every case, MRI was superior to CT scanning for delineating spatial relationships of the tumor to the 3rd ventricle, the optic apparatus, adjacent brain, and parasellar vasculature. Vessel encasement by tumor was clearly seen on MRI when there was no direct indication of this on other studies. Cavernous sinus invasion was not demonstrated by CT scanning but was indicated by MRI in 5 cases and was surgically confirmed in 3. MRI can provide more precise spatial information on extrasellar tumor extension. When MRI is available, it is the test of choice for the preoperative evaluation of patients with suspected large pituitary gland (sellar region) tumors. Contrast-enhanced CT scanning and angiography can be used as supplementary studies to add information inherently unique to these techniques.

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Author (Year)	Title	Study Description	Number of Patients	Classification Process/Evidence Class	Conclusions
Wu (2014)[30]	Usefulness of dual-energy computed tomography imaging in the differential diagnosis of sellar meningiomas and pituitary adenomas: preliminary report.	CT spectral imaging in both the arterial and venous phase were examined for macroadenomas and meningiomas. Normalized iodine concentrations, HU curve slope, and mean CT values of lesions in both the arterial and venous phases were calculated for each group independently. These values were compared between 2 groups using independent sample *t* tests.	33	Diagnostic/ III	Mean CT values using dual-energy CT had 90.9% sensitivity and 100% specificity in differentiating pituitary adenomas from meningiomas. Quantitative dual-energy CT imaging has promising potential for diagnostic differentiation of sellar meningiomas and pituitary adenomas.

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