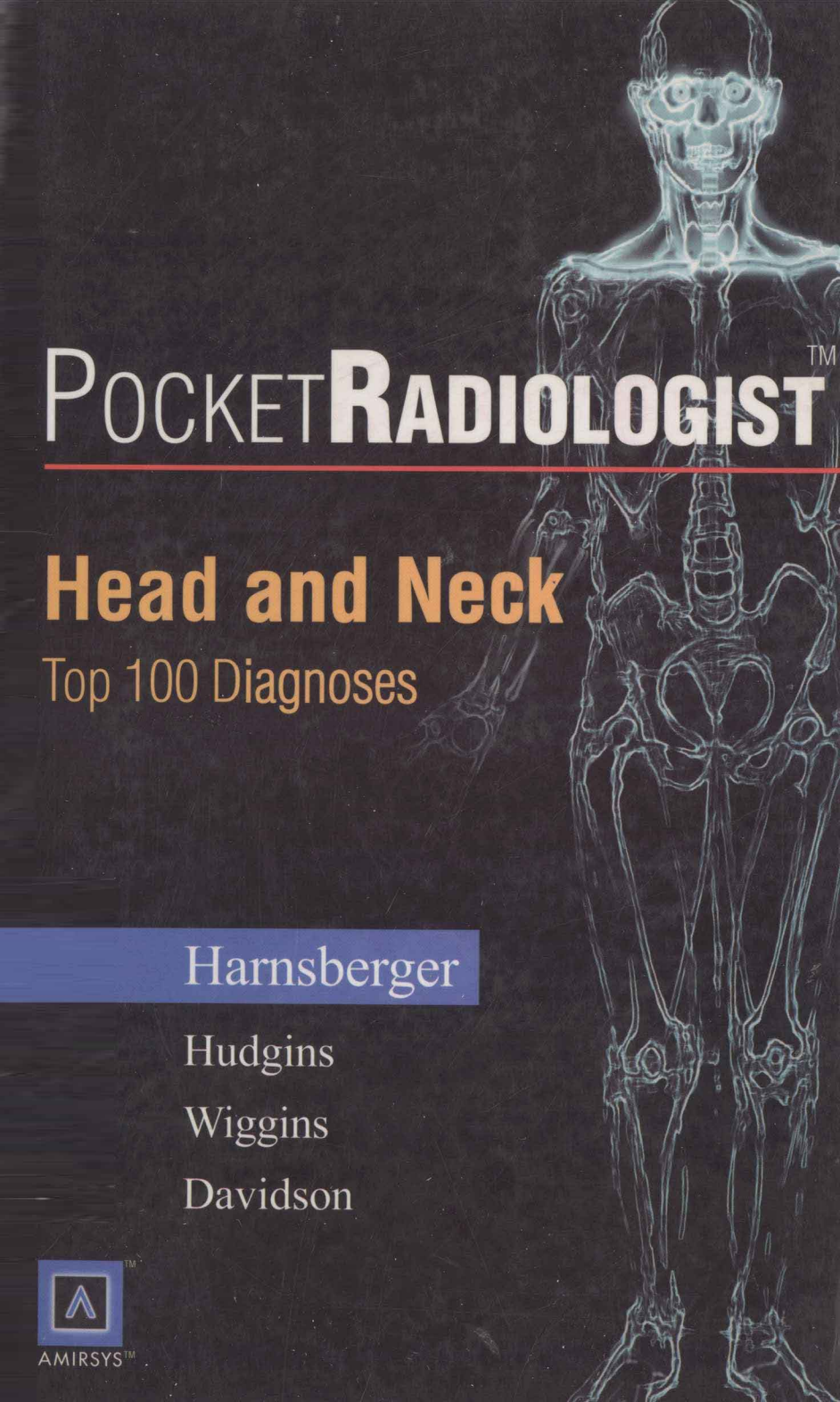

POCKET RADIOLOGIST™

Head and Neck

Top 100 Diagnoses

Harnsberger
Hudgins
Wiggins
Davidson

AMIRSYS™

PocketRadiologist™
Head and Neck
Top 100 Diagnoses

The diagnoses in this book are divided into 15 sections in the following order:

CPA-IAC
Skull Base
Temporal Bone
Orbit
Nose & Sinus
Pharyngeal Mucosal Space
Lymph Nodes
Larynx
Oral Cavity
Masticator Space
Parotid Space
Carotid Space
Midline Spaces
Visceral Space
Pediatric Lesions

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Top 100 Diagnoses

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Preface

The **PocketRadiologist™** series is an innovative, quick reference designed to deliver succinct, up-to-date information to practicing professionals "at the point of service." As close as your pocket, world-renowned authors write each title in the series. These experts have designated the "top 100" diagnoses or interventional procedures in every major body area, bulleted the most essential facts, and offered high-resolution imaging to illustrate each topic. Selected references are included for further review. Full color anatomic-pathologic computer graphics model many of the actual diseases.

Each **PocketRadiologist™** title follows an identical format. The same information is in the same place - every time - and takes you quickly from key facts to imaging findings, differential diagnosis, pathology, pathophysiology, and relevant clinical information. The interventional modules give you the essentials and "how-tos" of important procedures, including pre- and post-procedure checklists, common problems and complications.

PocketRadiologist™ titles are available in both print and hand-held PDA formats. Currently available modules feature Brain, Head and Neck, Orthopaedic (Musculoskeletal) Imaging, Pediatrics, Spine, Chest, Cardiac, Vascular, Abdominal Imaging and Interventional Radiology. 2003 topics that will round out the PocketRadiologist™ series include Obstetrics, Gynecologic Imaging, Breast, Temporal Bone, Pediatric Neuroradiology and Emergency Imaging.

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CPA - IAC

Table of Diagnoses

Epidermoid Cyst, CPA

CPA cistern epidermoid cyst. Graphic of epidermoid cyst of the CPA cistern illustrates the "bed of pearls" seen by the surgeon. The tendency of this lesion to engulf the cisternal portions of cranial nerves VII and VIII is depicted.

Key Facts

- Synonyms: Epidermoid tumor; non-neoplastic inclusion cyst
- Definition: Congenital lesion that arises from inclusion of ectodermal epithelial elements at the time of neural tube closure during the 3rd to 5th week of embryonic life, resulting in migration abnormalities of epiblastic cells
- Classic imaging appearance: Signal shows an **insinuating cisternal lesion** with low T1, high T2 close to that of CSF
  - FLAIR shows incomplete or absent attenuation
  - Diffusion-weighted imaging shows epidermoid cyst (EpC) has restricted diffusion (high-signal lesion)
- Other key facts
  - 3rd most common CPA-IAC mass
  - 1% of all intracranial tumors

Imaging Findings

General Imaging Features

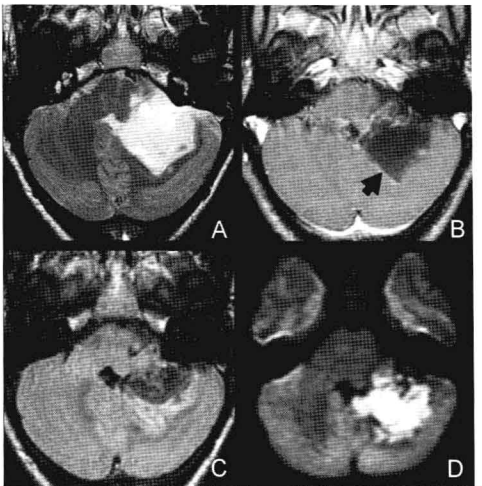
- Best imaging clue: Cisternal insinuation
  - Engulfs cranial nerves and vessels
- Mass **insinuates** into cisterns, engulfs cranial nerves and vessels
- Margins usually scalloped or irregular

CT Findings

- Resembles CSF on NECT scans
- Calcification in 20%
- No enhancement is rule; sometimes margin of cyst minimally enhances
- "Dense epidermoid" = rare variant

MR Findings

- Signal close to CSF on all standard MR sequences
  - T1 low, T2 high signal
  - T1 C+ images show EpC **does not enhance**
- "Dirty CSF" = MR description



Axial MR images through the low CPA cistern. T2 (A), T1 C+ (B), FLAIR (C) and diffusion (D) sequences are shown. High T2 signal, non-attenuation on FLAIR and diffusion restriction (high lesion signal in D) is characteristic of EpC. Insinuating margins and thin rim enhancement (arrow in B) also typical.

- FLAIR/CISS and diffusion MR are diagnostic
  - Does not null on FLAIR or CISS
  - High signal on diffusion scans (restricted diffusion)
- "White EpC" (high signal on T1) rare

Imaging Recommendations

- Begin with routine enhanced MR imaging
- FLAIR and diffusion sequences added to confirm diagnosis
- Follow-up imaging looking for recurrence must include FLAIR and diffusion sequences

Differential Diagnosis: Cystic CPA Mass

Arachnoid Cyst

- Pushes broadly on adjacent structures, does not insinuate
- Attenuates on FLAIR sequence
- Shows no restriction on diffusion weighted imaging

Benign Cystic Neoplasm

- Cystic meningioma and schwannoma will show some areas of enhancement on T1 C+ MR

Malignant Cystic Neoplasm

- Ependymoma and astrocytoma pedunculate from brainstem and 4th ventricle respectively
- Will show some foci of enhancement on T1 C+ MR

Pathology

General

- Etiology-Pathogenesis
  - From inclusion of **ectodermal elements** during neural tube closure
- Epidemiology

- Posterior fossa most common site
- CPA 75%, 4th ventricle 25%

Gross Pathologic, Surgical Features

- Pearly white, "the beautiful tumor"
- Lobulated, cauliflower-shaped surface features
- Insinuating growth pattern in cisterns, engulfs vessels and nerves

Microscopic Features

- Cyst wall: Simple stratified cuboidal squamous epithelium
- Cyst contents: Solid crystalline cholesterol, keratinaceous debris
  - Does not contain hair follicles, sebaceous glands or fat in contrast to dermoid
- Grows in successive layers by desquamation from the cyst wall

Clinical Issues

Presentation

- Principal presenting symptom: Dizziness
- Broad presentation from 20 to 70: Peak age = 40
- Other symptoms: Depend on location, growth pattern
  - Headache
  - Trigeminal neuralgia (tic douloureux)
  - Facial neuralgia (hemifacial spasm)
  - Sensorineural hearing loss

Natural History

- Grows slowly, remains clinically silent for many years

Treatment

- Complete surgical removal is goal
- If recurs, takes many years to grow

Prognosis

- Smaller cisternal lesions are readily cured with surgery
- Larger lesions where upward supratentorial herniation has occurred are more difficult to completely remove

Selected References

1. Dechambre S et al: Diffusion-weighted MRI postoperative assessment of an epidermoid tumor in the cerebellopontine angle. Neuroradiology 41:829-31, 1999
2. Ikushima I et al: MR of epidermoids with a variety of pulse sequences. AJNR 18:1359-63, 1997
3. Gao P et al: Epidermoid tumor of the cerebellopontine angle. RadioGraphics 13:863-72, 1992

Arachnoid Cyst, CPA

Drawing of arachnoid cyst in the CPA cistern. The translucent cyst in this case is shown displacing the 7th and 8th cranial nerves. In most cases, the AC is an incidental finding unrelated to the patient's symptoms. The insert in the left lower quadrant shows an AC (arrow) on axial T2-FSE MR image.

Key Facts

- Synonyms: Primary or congenital arachnoid cyst (AC)
- Definition: Arachnoid or collagen-lined cavities that do not communicate directly with the ventricular system or the subarachnoid space
- Classic imaging appearance: Cystic cisternal mass with almost imperceptible walls with CSF density (CT) or intensity (MR)
- Split arachnoid contains CSF
- 10% of all AC occur in posterior fossa
  - CPA = Most common infratentorial site
- Often an incidental finding on MR imaging of the brain

Imaging Findings

General Imaging Features

- Best imaging clue: **Complete fluid attenuation** (low signal) on FLAIR MR imaging with **no diffusion restriction** on diffusion sequence
- Resembles CSF in density (CT) and signal intensity (MR)
- Focal lesion that pushes cisternal structures but does not insinuate
- Sharply demarcated round or ovoid lesion

CT Findings

- Density same as CSF
- Higher density from hemorrhage or proteinaceous fluid rare
- No enhancement of cavity or wall
- Rarely causes pressure erosion of adjacent bone

MR Findings

- Signal parallels CSF on all sequences
- Suppresses completely (low signal) with FLAIR
- No restriction (low signal) on diffusion MR

CPA arachnoid cyst. Axial T2 (A), T1 C+ (B), FLAIR (C) and diffusion (D) sequences are shown. High signal AC on T2 image (arrow in A) does not enhance (B). Low signal on FLAIR sequence (C) indicates fluid attenuation has occurred. No diffusion restriction is seen as low signal on the diffusion sequence (D).

Differential Diagnosis: Cystic CPA Mass

Epidermoid Cyst
- Shows restriction (high signal) on diffusion MR
- Insinuates adjacent CSF spaces and structures

Cystic Neoplasm
- Cystic meningioma, schwannoma, ependymoma, astrocytoma all will show some foci of enhancement on T1 C+ MR

Neurenteric Cyst
- Very rare lesion
- Often contains proteinaceous fluid (high-signal on T1 MR sequences)

Pathology

General
- Etiology-Pathogenesis
  - Embryonic meninges fail to merge
  - Noncommunicating fluid compartment surrounded by arachnoid is formed that contains CSF
- Epidemiology
  - Accounts for 1% of intracranial masses

Gross Pathology, Surgical Features
- Fluid-containing cyst with translucent membrane
- May displace but does not engulf adjacent vessels or cranial nerves

Microscopic Features
- Thin wall of flattened but normal arachnoid cells
- No inflammation or neoplastic change