RESULTS

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Sixty-three patients with various pathological findings were selected in our study and One case with agenesis of the nose.

The sixty-four cases were classified into four main groups :Cerebello-pontine angle lesions, Middle ear and mastoid, Nose &paranasal sinuses and Throat. The throat group was classified into five subgroups : Oral cavity, nasopharynx, oropharynx, larynx and salivary gland.

The site, clinical diagnosis, age, sex, site of the lesion, main presenting symptom, type of signal intensity in both T1&T2-weighted images, enhancement after Gd-DTPA injection, histopathology result and treatment modality (RX) for the study population are listed in tables.

-Selected cases from each group and subgroup were presented.

-The examined patients are categorized anatomically as in table I.

-According to the ENT symptomatology,the patients could also be grouped as in table II.

Table I: Type of MRI examination in the study

MRI examination	*No. of cases*
Posterior fossa	12
Petrous bone	8
Nose & Paranasal Sinuses	11
Sella (Pituitary)	9
Nasopharynx	10
Skull base	2
Oral Cavity	3
Oropharynx	1
Larynx	5
Parotid glands	3
TOTAL	*64*

Table II: Main Presenting Symptom of the Patients

Symptom	*No. of Cases*
Deafness	11
Headache	9
Nasal Blockage	7
Visual Disturbances	6
Tinnitus	4
Dysphagia	4
Cervical Lymphadenopathy	3
Hoarsness	3
Pre-auricular Swelling	3
Ear Pain	2
Snorring	2
Facial Disfigurement	2
Hormonal Imbalance	2
Mouth Bleeding	1
Facial Numbness & Pain	1
Post-auricular Swelling	1
Epistaxis	1
Stridor	1
Odynophagia	1
TOTAL	*64*

Cerebello-pontine Angle

Case 1

A 30-year-old female had right ear deafness and tinnitus for almost eight years. Examination revealed nothing other than the hearing defect. The audiogram showed right severe sensorineural deafness up to 2 Khz and left normal hearing.

SRT were 70 dB,25 dB in the right and left ears respectively. SDS were 60%& 100% in the right and left ears. B.E.R.A. showed that the inter-aural latency difference of wave V was 0.4 msec.

CT scan done in 1989 showed widening of right internal auditory canal but the recent one showed CPA mass of 5 mm in diameter.

MRI study was done in which post-contrast axial & coronal T1 weighted image showed dumb-bell shaped enhanced intensity intra & extra-canalicular in location consistent with **acoustic neurinoma**. *(Table III. case 2 / Figure. I)*

Surgery was offered to the patient but she refused surgery.

Case 2

A 26-year-old male who presented to the ER with headache of two months duration, occasional vomiting of three weeks duration and blurring of vision of ten days duration.

On examination,there were induced nystagmus in all directions,severe bilateral papilloedema and diminshed hearing in the right ear and positive cerebellar signs. Audiogram showed right moderate high tones sensorineural hearing loss & normal hearing in the left ear.

SRT were 30 dB & 20 dB in both right & left ears respectively. SDS were 50% & 100% in the right&left ears. Brain evoked response audiometry showed that wave I was the only present in the right ear and the other waves were absent,the left ear showed all the waves.

The MRI showed huge right lollipop extra-axial CPA tumour mass pedunculated from the right seventh & eighth nerve bundle . *(Table III.case 3 / Figure. 2)*

Right posterior fossa craniectomy and tumour excision plus end to end facial-neural-anastomosis was done.

The histopathology result came to be **acoustic schawannoma** .

Case 3

A 34-year-old male complaining of right eye pain, blurring of vision and numbness of the right side of the face for the last three months. On examination, there was absent corneal reflex, diminished sensation of the face on the right side. Audiogram showed normal hearing in both ears. SRT were 20 dB &15dB in the right and left ears. SDS were 95% & 100% in the right and left ears.

BERA showed no interwave V latency difference between both ears. CT scan showed enhanced right parasellar mass with destruction of right petrous bone. Angiography showed abnormal neovascularity.

MRI revealed an extra-axial oval shaped right parasellar mass lesion with posterior extension into the posterior fossa and Meckel's cave of intermediate signal in T1 and heterogenous hyperintensity signal in T2-W images. It showed intense enhancement after Gd.injection, consistent with **trigeminal schwannoma.** The mass was excised and the pathology came to be schwannoma. *(Table III. case 6 / Figure. 3)*

Case 4

A 30-year-old female complaining of machinary tinnitus in her right ear for eight months duration which was synchronus with her pulse. She had also mild deafness in her right ear. On examination, there was non-pulsating red shiny mass behind the intact ear-drum (rising- sun appearance) in the right ear. There was no audible bruit over the mastoid or the cheek and no neurological cranial nerve deficit.

Audiogram showed right mild conductive hearing loss and left normal hearing. The SRT values were 40 dB & 20 dB in both the right and left ears. The SDS were 90% & 100% in the right and left ears. Tympanometry showed bilateral type A.

Right carotid angiography showed highly vascular lesion occupying the jugular fossa which showed a considerable vascularity from both internal & external carotid system. CT scan and MRI of the skull base showed a highly vascular enhancing mass, rounded 1/2 - 1cm in diameter, centered over the right jugular fossa which showed rarifaction of the bony cortex. It was consistent with **glomus jugulare** tumour. *(Table III. case 7 / Figure.4)* Surgery was offered but the patient asked to take an second opinion in other place.

Case 5

A 52-year-old male was known case of hypertension since the last ten years. He was presented in the E.R. with left hemiplegia, dysarthria, dysphagia and chocking. there was no evidence of bleeding but it was due to compression on the pons.

Examination revealed left facial and hypoglossal cranial nerves paralysis of upper motor neurone. CT scan of the brain showed big basilar artery aneurysm marginally calcified, pressing on the brain stem & pons. Vertebral angiography revealed partial thrombosis of basilar artery aneurysm. Brain MRI showed heterogenous low and intermediate signals of mass lesion along the anatomical course of basilar artery denoting **thrombosis of the basilar artery aneurysm.** *(Table III. case 8 / Figure . 5)*

Case 6

A 33-year-old female had dizzines for the last two weeks, diminished hearing on the right ear, dysphagia and weakness of the right side of the face. On examination, there was absent gag reflex, cranial nerve palsies of V, VI, VII, VIII, IX and X.

Audiogram showed total loss of hearing of the right ear and normal hearing in the left ear.

SRT were zero & 20 dB in the right & left ears. SDS were zero & 100% in the right and left ears. B.E.R.A. showed no waves in the in the right ear and normal response in the left ear. Angiography was not informative.

MRI showed oval-shaped extra-axial right CPA lesion of intermediate signal with hyperintense spotting signal in T1-weighted image. The lesion showed intense & homogenous enhancement after contrast consistent with **CPA cavernous hemangioma.** *(Table III. case 9 Figure . 6)*

The mass was excised through retrosigmoid craniectomy.

Cerebello-pontine Angle

Table III: CPA lesions

Case No.	Diagnosis	Age/Sex side	Symptom	T1-W	T2-W	Contrast	Biopsy Result	Rx.
I	Acoustic Neurinoma	46/M(Rt)	S.N.H.L.	Hypo.	Hypo	Enh.het.	+ve	Excision
II	Acoustic Neurinoma	30/F(Rt)	S.N.H.L.	Hypo.	Hypo	Enh.	N.A.	None
III	Acoustic Neurinoma	26/M(Rt)	S.N.H.L.	Hypo.	Hypo	Enh.het.	+ve	Excision
IV	Acoustic Neurinoma	40/M(Rt)	S.N.H.L.	Hypo.	Hypo	Enh.het.	+ve	Excision
V	Post.op.Ac.Neurin.	46/M(Rt)	S.N.H.L.	Hypo.	Hypo	Enh.hom.	N.A.	None
VI	Trigeminal Neurin.	34/M(Rt)	Fac.numb.	Iso.	+het.	Enhanced	+ve	Excision
VII	Glomus Jugulare	30/F(Rt)	Puls.Tinn.	- / Iso	+ / -	Enh.het.	N.A.	None
VIII	Thr.of basilar aneur.	52/M(C)	S.N.H.L.	- / Iso	- / Iso	None	N.A.	None
IX	CPA Cav.Haemang.	33/F(Rt)	S.N.H.L.	Iso / +	Hyper	Enh.hom.	+ve	Excision
X	CPA Cav.Haemang.	29/M(Rt)	S.N.H.L.	Iso / +	Hyper	Enh.hom.	+ve	Excision
XI	Vascular Loop	38/F(Lt)	S.N.H.L.	S.V.	S.V.	N.A.	N.A.	None
XII	Arachnoid Cyst	50/F(Lt)	Tinnitus	Hypo.	Hyper	N.A.	N.A.	None
XIII	CPA Meningioma	50/F	Dysphagia	Hypo.	Hypo.	Enhanced	N.A.	None

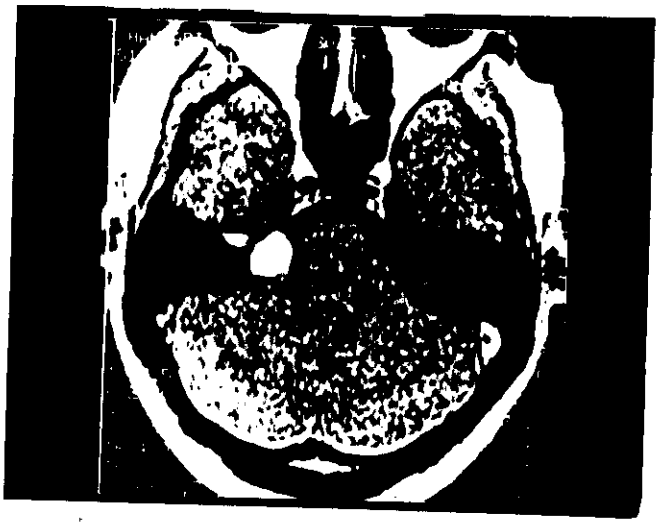
Post.op. Ac. Neurin. = Postoperative Acoustic Neurinoma; Thr. of basilar aneur. = Thrombosis of basilar aneurysm;
CPA Cav. Haemang. =CPA Cavernous Haemangioma; F. mag. Meningioma = Foramen magnum Meningioma

M=Male;F=Female;S.N.H.L=Sensorineural hearing loss;Fac. numb.=Facial numbness
Puls. Tinn.=Pulsatile Tinnitus

Hypo.= Hypointensity signal;Iso. = Isointensity; - / Iso = Hypo&Iso-intensity;
Iso / + = Iso&Hyper-intensity; Hyper.=Hyperintensity;
+ het.=heterogenous hyperintensity; + / - = hyper&hypo-intensity; S.V. = signal void;
Enh. = Enhanced;Hom.=Homogenous;N.A.= Non-applicable;+Ve= positive

Figure 1: Acoustic Neurinoma

a) Axial T1-W image post-contrast.



b) Coronal T1-W image post-contrast.

Figure 2: Acoustic Neurinoma

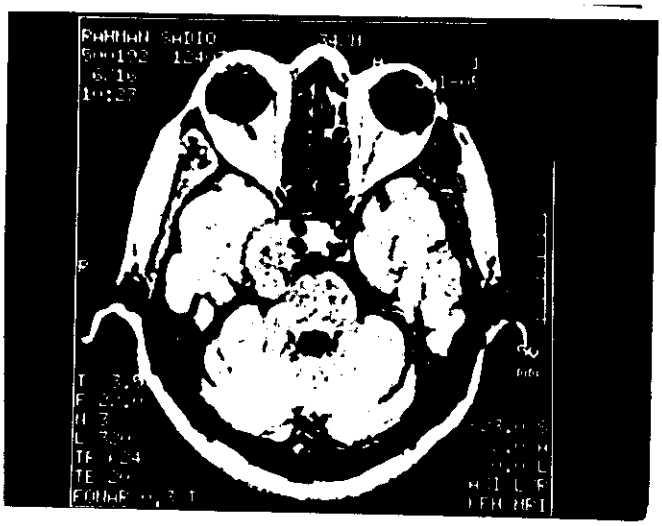
a) Axial T1-W image .

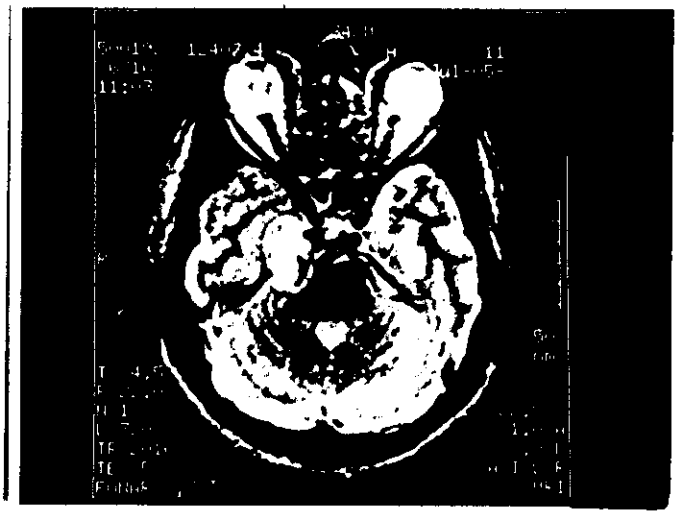
b) Axial T1-W image post-contrast.

Figure 3: Trigeminal Neurinoma

a) Axial T1-W image .

b) Axial T2-W image.





c) Axial T1-W image after Gd-DTPA injection.

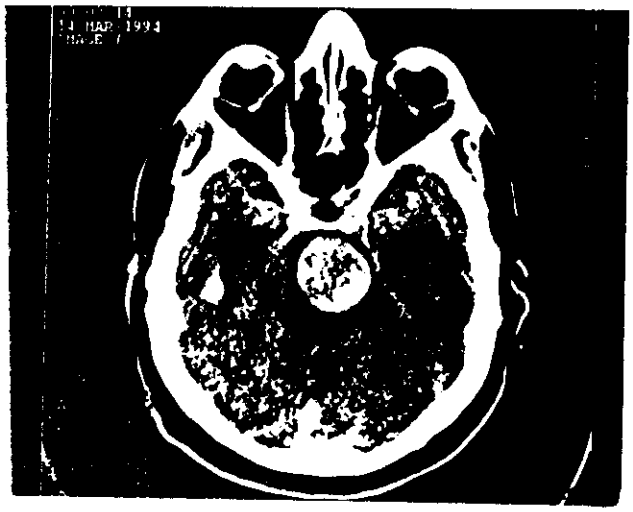
Figure 4: Glomus Juglare Tumour

a) Axial T1-W image post-contrast.

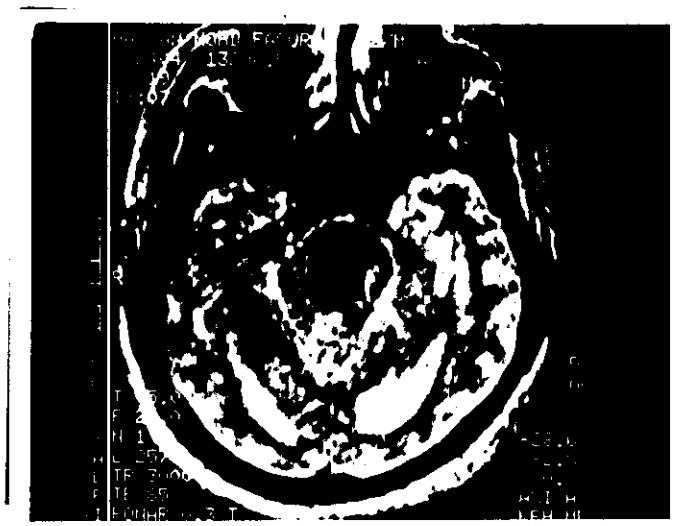
b) Coronal T1-W image post-contrast.

Figure 5: Thrombosed Basilar Artery Aneurysm

a) Axial CT scan .



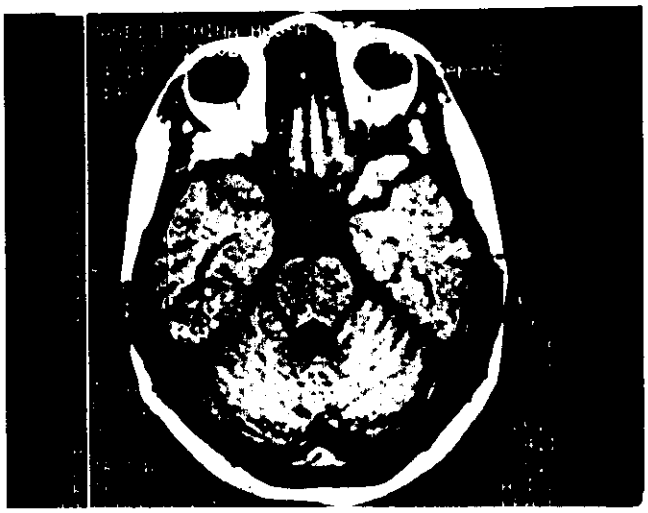
b) Axial T2-W image.



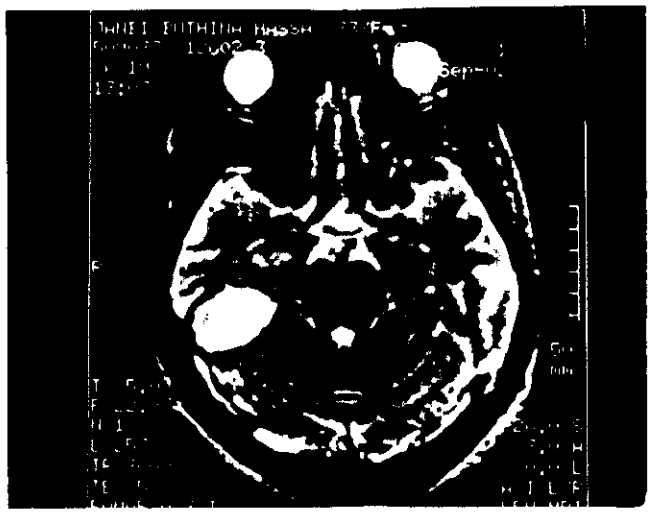
c) Left vertebral Angiogram .

Figure 6: CPA Cavernous Hemangioma

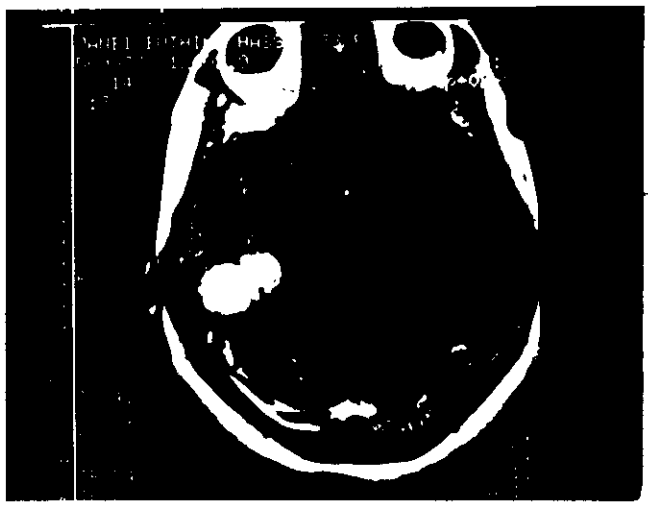
a) Axial T1-W image.



b) Axial T2-W image.



c) Axial T1-W image following contrast.



Mastoid & Middle Ear

Case 1

A 30-year-old female complaining of right pulsatile tinnitus for four months which was continuous,relieved when she pressed over the side of her neck.She had no hearing loss or vertigo.

On examination,there was opaque tympanic membrane and bruit could be elecited over the jugular vein in the neck. Audiogram revealed normal hearing and tympanometry showed type A. CT scan showed widening of the right jugular foramen with intact cortical outline. Angiogram showed no mass but there was high juglar bulb.

(Table IV. case 2 Figure . 7)

MRI showed dominant **high right jugular bulb.**

Case 2

A 25-year-old female who had left ear discharge,occasional machinery intermittent tinnitus and deafness since childhood. On examination,the left ear showed narrow meatus filled by a polyp and mucoid discharge .

Audiogram showed left mild conductive hearing loss and right normal hearing. SRT were 20 dB& 35 dB in the right and left ears respectively. SDS were 95% and 85% in the right & left ears. CT scan showed erosion and ballooning of the deep external canal with soft tissue filling it .

MRI revealed iso-intense mass lesion filling the external canal in T1-W image which showed no change in signal intensity in T2-W image and did not enhance after Gd-DTPA administration.

Left external ear exploration and meatoplasty was done in which cholesteatoma sac was found behind the polyp, the anterior meatal wall was eroded. *(Table IV. case 3 Figure 8)*

The histopathology confirmed the diagnosis of **external ear cholesteatoma**.

Case 3

A 42-year-old male who had bilateral ear discharge and deafness since childhood.The patient had tympanoplasty twice in each ear before. On examination,there were aural polyps in both ear canals ,larger in the left,and large anterior central perforation in the left ear . Audiogram showed right moderate mixed hearing loss and left moderate conductive hearing loss. SRT were 60 dB & 45 dB in the right and the left ears. SDS were 75%& 90% in right & left ears respectively. CT scan showed mastoid mass lesion eroding the posterior meatal wall and extending into the left external canal.

Mastoid & Middle Ear

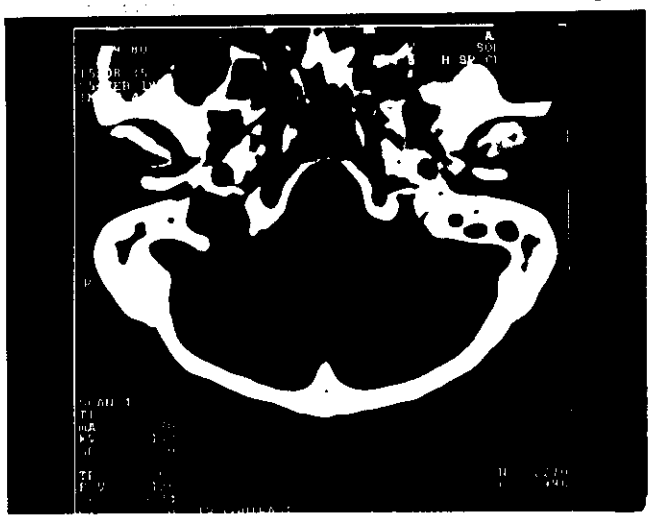
Table IV : Mastoid & Middle ear lesions

Case No.	Diagnosis	Age/Sex side	Symptom	T1-W	T2-W	Contrast	Biopsy Result	Rx.
I	H.J.B.& Mastoiditis	40/ M / Rt	Tinnitus	S.V.	S.V.	N.A.	N.A.	Medical
II	H.J.B	30/ F / Rt	Tinnitus	S.V.	S.V.	N.A.	N.A.	Medical
III	Cholesteatoma	25/ F/ Lt	C.D.	Iso.	Iso.	Non Enhan	+Ve	Surgical
IV	Aural Polyps	42/ M / Bil	C.D.	Iso.	Hyper	Rim Enhan	+Ve	Surgical
V	Brain abscess	15/ M / Rt	Headache	Iso / -	- / +	Edge Enhan	N.A.	Medical
VI	Epidermoid Cyst	2m/ M/ Lt	P. A.Sw.	Hyper	Hyper	N.A.	+Ve	Surgical
VII	Sigmoid Sinus Thr.	27 / M / Rt	Headache	Hyper	Hyper	Enhanced	N.A.	Medical

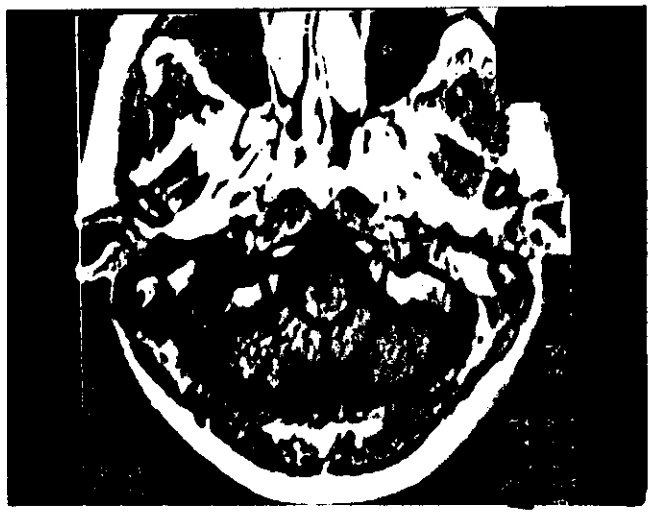
H.J.B. = High jugular bulb ;Thr. = Thrombosis;C.D. = Conductive deafness;
P.A.Sw. = Post-auricular Swelling;;S.V. = Signal Void;Iso. = Isointensity signal;
Hyper.= Hyper-intensity; - / + = Hypo&Hyper-intensity;N.A. = Non-applicable;
Enhan. = Enhancement

Figure 7: High Jugular Bulb

a) Axial CT scan .



b) Axial T1-W image post-contrast .

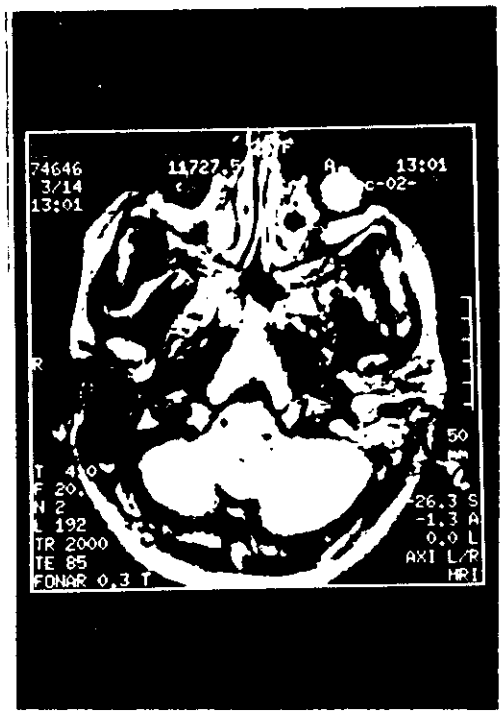


c) Coronal T1-W image post-contrast.

d) Carotid Angiogram (basal view of the venous phase).

Figure 8: Left External Ear Cholesteatoma

a) Axial T2-W image.



b) Coronal T1-W image post-contrast.

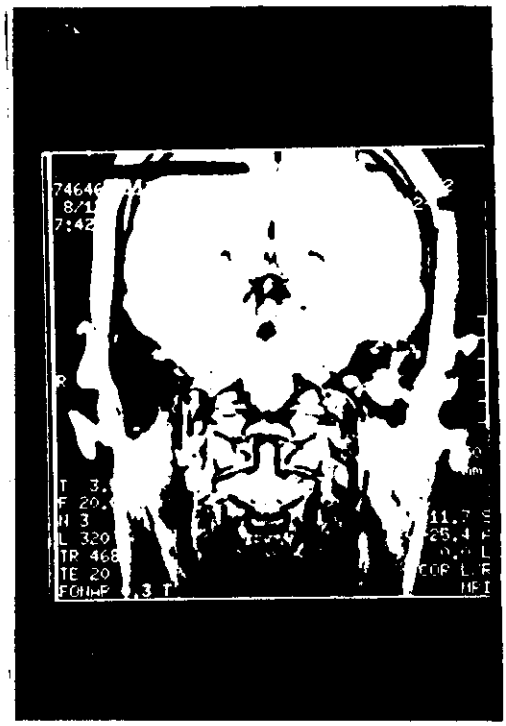


Figure 9 : Bilateral Chronic Suppurative Otitis Media

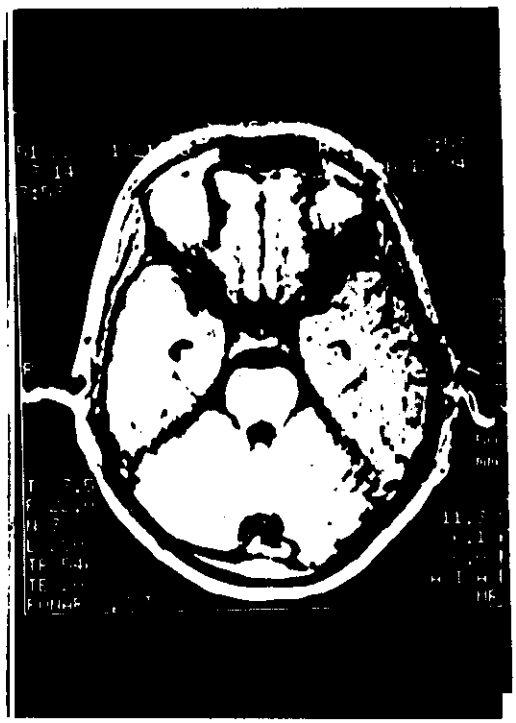
(cholesteatoma,mastoiditis and aural polyps)

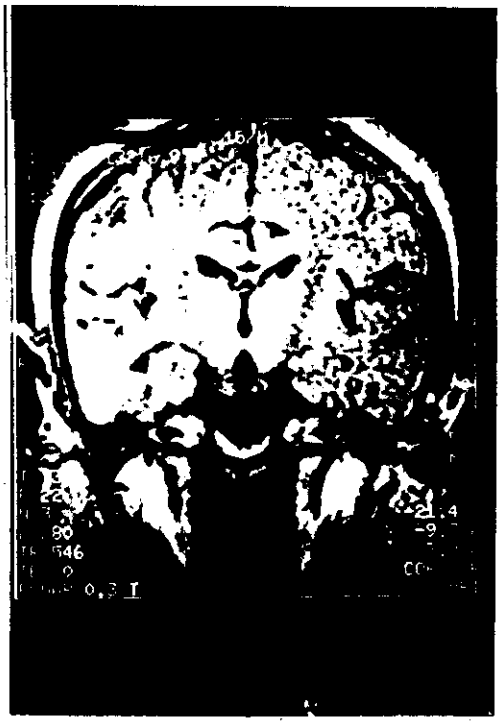
a) Coronal T1-W image post-contrast.

b) Axial T2-W image.

Figure 10: Temporal lobe Brain Abscess

a) Axial T1-W image after contrast.
b) Coronal T1-W image after contrast.

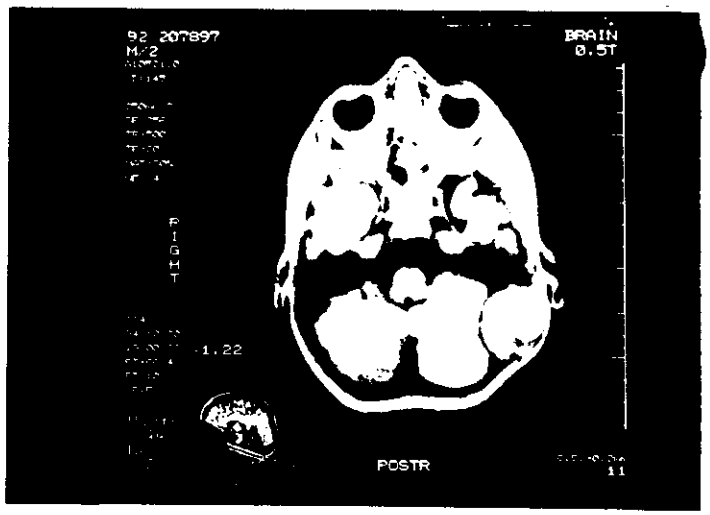




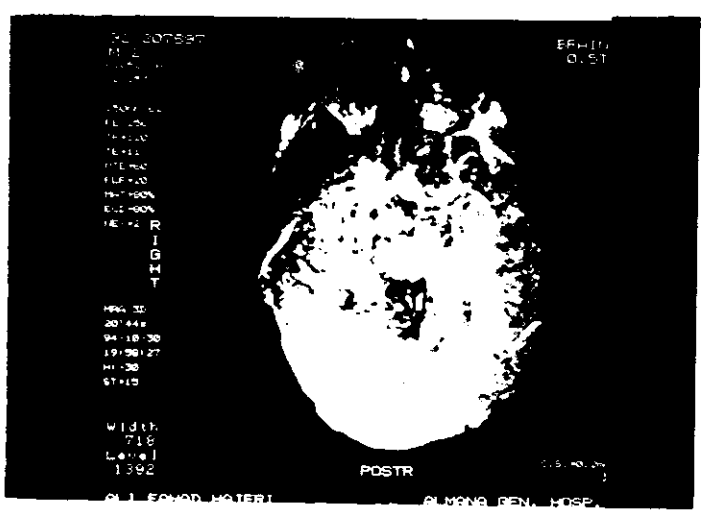
c) Axial T2-W image.

Figure 11: Epidermoid Cyst

a) Axial CT-scan .
b) Axial T1-W image.



c) MRA.



Nose & Paranasal Sinuses

Case 1

A 21-year-old female complaining of bilateral eye protrusion for 2 years with frontal headache and nasal obstruction for two months. On examination,she had obvious proptosis of both eyes,no neurological deficit with intact cranial nerves.

The nose examination revealed unilateral nasal mass which filled the right nasal fossa and mucopurulent discharge.

CT scan showed bony erosion in the medial and lateral walls of both maxillary sinuses,lamina papyraeia and posterior wall of the frontal sinus by soft tissue mass which invaded both orbits more the left and mostly all the sinuses including the sphenoids and extended intracranially,involving the sella,suprasellar with compression of the optic chiasm and bilateral cavernous sinus involvement also noted.

MRI pre and post-contrast was consistent with the same findings but it could show also peripheral enhancement of left maxillary sinus with strongly hypointense contents (signal void). The right antrum showed markedly thickened mucosa with well-demonstrated heterogenous enhanced soft tissue mass. *(Table V . case 6 / Figure. 12)*

The nasal mass was biopsed and the histopathology was compatible with **Chronic Invasive Aspergillosis of Paranasal Sinuses** with skull base and intracranial extension.

The patient was recommended to start on Amphotercin B (initial dose: 0.1mg / kg then maintaned on 1mg / kg daily) for at least two months followed by staged operations for the resection of her pathology.

Case 2

A 15-year-old female referred from private hospital with chief complaint of left epiphora of one year duration,gradual left eye swelling of six months duration,frontal headache,left nasal blockage of one month duration,nasal discharge and diminshed hearing. History of intranasal polypectomy and antrostomies one month ago in private hospital.

On examination,there was assymetry of the face,left eye proptosis,deviated nasal septum to the right side,greenish blackish discharge,both ears showed signs of secretory otitis media. Audiogram showed bilateral mild conductive hearing loss and tympanometry showed flat curves. CT scan showed opaque left ethmoid sinuses,maxillary sinus,both sphenoid sinuses and right ethmoid sinus.

MRI pre - and post-contrast showed large isointense soft tissue mass filling the nasal cavity more on the left side involving the mentioned sinuses as in CT scan description but showed also the involvement of the orbit. After T2,the previously described lesion

showed high signal intensity indicating the high water content of this lesion,areas of signal void represent the calcium content inside this lesion. After contrast,it showed massive enhancement with areas centrally of signal void.There was no intracranial extension. *(Table V. case 8 / Figure .13)*

The patient underwent left Jansen Horgan's operation and external ethmoidectomy with opening of the sphenoid sinus as well.

The histopathology was consistent with **Allergic Aspergillus Sinusitis**.

Case 3

A 20-year-old male presented to the ENT clinic with a chief complaint of severe frontal headache,right frontal swelling and bilateral nasal discharge. Patient had exploration of the right frontal sinus with osteoplastic flap and removal of frontal osteoma 18 months ago.

On examination,there was right frontal swelling which was tender & fluctuant,scar over right eyebrow(previous operation),anterior rhinoscopy showed hypertrophied inferior turbinates and posterior rhinoscopy showed mucopurulent discharge in the postnasal space.

CT scan showed opaque right frontal sinus,and partially erosion of the bonel overlying the sinus. To rule out any meningeal tear or meningocystocele, CTmyelogram was done

.

MRI showed opacified right frontal sinus with soft tissue lesion which showed mixed hyperintensity & isointensity signals in T1- W and hyperintensity signals in T2 W-images,suggestive of high protein content sinus fluid. Other sinuses apart from the left frontal and sphenoid sinuses showed inflammatory changes.

(Table V. case 10 / Figure .14)

The patient underwent right Howarth operation (Fronto-ethmoidectomy) in which the diagnosis was proved to be **right frontal pyocele.**

Case 4

A 14-year-old female who complained of amenorrohea and blurring of vision of two months duration. Hormonal assay was done which revealed galactorrohea and prolactinaemia .

MRI of pituitary was done which showed after contrast that there was a **microadenoma** involving the infundibular stalk & right sided posterior of the gland . The tumour was contrasting against the normally enhancing pituitary gland tissue.

The patient was treated medically. *(Table VI. case 12 / Figure . 15)*

Case 5

An 33-year-old male who had sudden diminution of his vision of one week duration and frontal &retro-orbital headache for one month. CT scan showed sellar & suprasellar tumour with some bony erosion adjacent to it. MRI for the pituitary gland showed a large oval shaped sellar & suprasellar mass lesion encroaching upon the suprasellar cistern and optic chiasma. The tumour showed heterogenous pattern of contrast enhancement. *(Table VI . case 14 / Figure . 16)*

The diagnosis was compatible with **pituitary macroadenoma**.

The patient underwent trans-septal / trans-sphenoidal hypophysectomy. The histopathology was chromophobe adenoma.

Case 6

An 34-year-old female complaining of headache;blurring of vision and occasional vomiting for almost six years. She was known case of pituitary microadenoma which been treated conservatively for the last six years. Tomogram and CT scan of the pituitary indicated the presence of intrasellar mass.

The MRI showed that the gland was markedly compressed and the sella turcica was full of C.S.F signal in continuity with the chiasmatic cistern making the diagnosis of **primary empty sella syndrome** was clear. *(Table VI . case 19 / Figure . 17)*

Case 7

A 19-year-old male presented in E.R. with main complaint of blurring of vision and headache for two year duration. The headache was mainly frontal ,intermittent with occasional vomiting. History of VP shunt insertion of one year back.

On examination,the patient was conscious,alert with bilateral temporal hemianopia more on the right side,bilateral optic atrophy;diminshed corneal reflex;mild right upper motor neurone facial palsy;diminshed gag reflex;mild impairment of hearing in the right ear;bilateral horizontal nystagmus;uvula was deviated to the left side. The patient had normal pituitary hormonal assay.

Brain CT scan revealed suprasellar tumour;carotid angiography showed that the tumour was not vascular. MRI of the brain showed a large sellar and suprasellar tumour of mixed intermediate&low signal extending down to the sphenoid sinus & posteroinferiorly to the pons.Post-contrast coronal image showed thick marginal enhancement of the mass

giving the impression of **Craniopharyngioma**. *(Table VI. case 21 / Figure. 18)* Surgery was offered to the patient.

Nose & Paranasal Sinuses

Table V : Nose & Paranasal Sinuses

Case No.	Diagnosis	Age/Sex Side	Symptom	T1-W	T2-W	Contrast	Biopsy Result	Rx.
I	Max. Sinus Cyst	25/M/ Rt	Nasal block	Hypo.	Hyper.	N.A.	N.A.	N.A.
II	Max.Sinus Cyst	34/M/Lt	Nasal block	- / Iso.	Mixed	N.A.	N.A.	Surgery
III	Max.Sin./Fluid Level	44/M/Rt	Nasal block	Hypo.	Hyper.	N.A.	N.A.	Surgery
IV	Max.Sin/ Fluid Level	35/M/Lt	Nasal block	Hypo.	Hyper.	N.A.	N.A.	Surgery
V	Nasal Agenesis	4m/ M	Facial Disf.	- & Iso.	- & Iso	N.A.	N.A.	Surgery
VI	Ch. Invasive Asperg.	21/ F	Headache	S.V/ Iso	S.V/ +	Het. Enh.	+Ve	Surgery
VII	Ch. Invasive Asperg.	32/ F	Headache	S.V/ Iso	S.V/ +	Het. Enh.	+Ve	Surgery
VIII	Allergic Asperg. Sin.	15/F	Nasal block	S.V/ Iso	S.V/ +	Het. Enh.	+Ve	Surgery
IX	Infratemp. Lymphang	5/M/ lt	Facial Disf.	Hypo.	Hyper.	N.A.	N.A.	N.A.
X	Frontal Pyocele	20/M/Rt	Headache	Iso / +	Hyper.	Rim Enh.	N.A.	Surgery
XI	Ethm.Max.Mucocele	14/M/Rt	Nasal block	Iso.	Hyper.	Rim.Enh	N.A.	Surgery

Max.Sin..= Maxillary Sinusitis;Ch. Invasive Asperg. = Chronic Invasive Aspergillosis;
Infratemp. Lymphang. = Infratemporal Lymphangioma.

Disf. = Disfigurement;Hypo. =Hypo-intensity; - / Iso. = Hypo-&Iso-intensity;
S.V. / Iso.= Signal Void / Iso-intensity; + = Hyper-intensity;N.A.= Non-applicable.

Het. Enh. =Heterogenous Enhancement; +Ve = Positive.

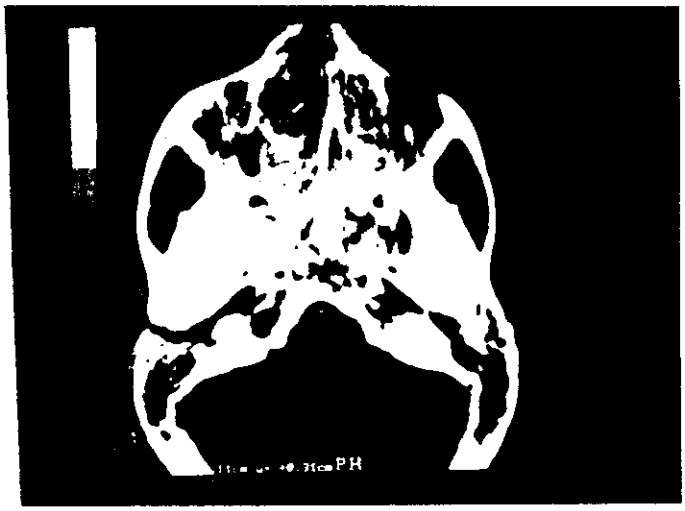
Table VI : Pituitary Gland Lesions

Case No.	Diagnosis	Age/Sex	Symptom	T1-W	Contrast	Biopsy Result	Rx.
XII	Microadenoma	14 / F	Hormonal Imb.	Hypo.	Weak Enhan.	N.A.	Medical
XIII	Microadenoma	16 / F	Hormonal Imb.	Hypo.	Weak Enhan.	N.A.	Medical
XIV	Macroadenoma	33 / M	Diminsh Vision	Iso.	Patchy Enhan	+Ve	Surgery
XV	Macroadenoma	33 / F	Diminsh Vision	Iso.	Patchy Enhan	+Ve	Surgery
XVI	Macroadenoma	58 / M	Diminsh Vision	Iso.	Patchy Enhan	+Ve	Surgery
XVII	Macroadenoma	62 / M	Diminsh Vision	Iso.	Patchy Enhan	+Ve	Surgery
XVIII	Macroadenoma	73 / M	Diminsh Vision	Iso.	Patchy Enhan	N.A.	N.A.
XIX	Empty Sella	34 / F	Headache	S.V.	N.A.	N.A.	Medical
XX	Empty Sella	41 / M	Headache	S.V.	N.A.	N.A.	Medical
XXI	Craniopharyng.	19 / M	Diminsh Vision	Iso / -	Thick Margin.	+Ve	Surgery

Craniopharyng. = Craniopharyngioma; Imb. = Imbalance;Hypo. = Hypo-intensity;Iso.=Iso-intensity;
S.V.= Signal Void; Iso. / - = Iso-&hypo-intensity;Enhan.=Enhancement;N.A.= Non-applicable;
Margin. =Marginal; + Ve = Positive.

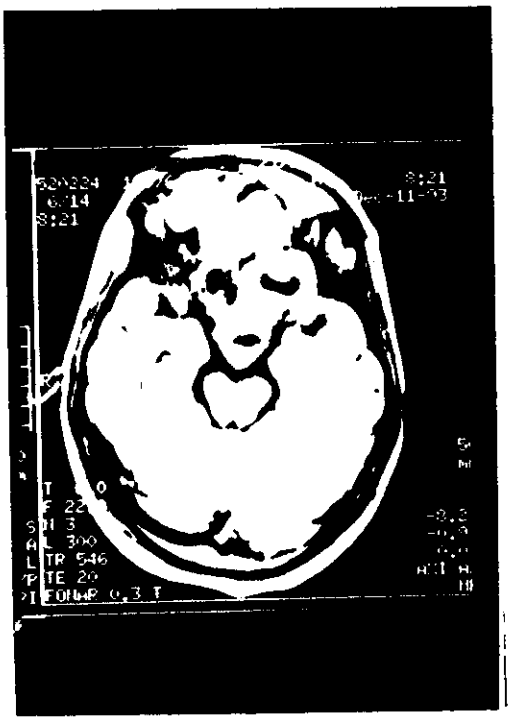
Figure 12: Invasive Aspergillosis of Paranasal Sinuses

a) Axial CT-scan .

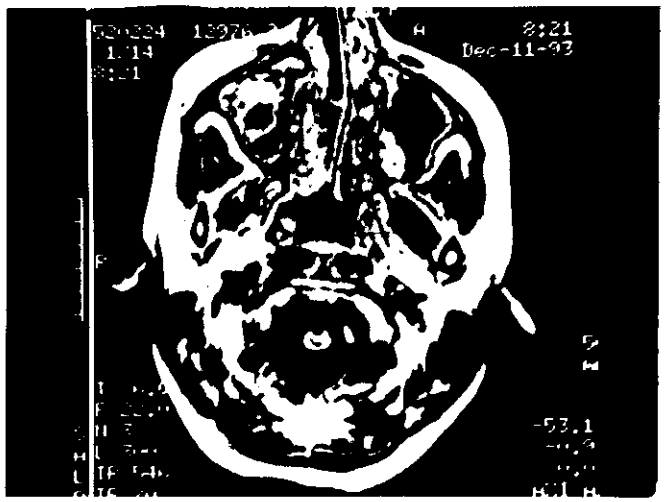


b) Coronal CT-scan.

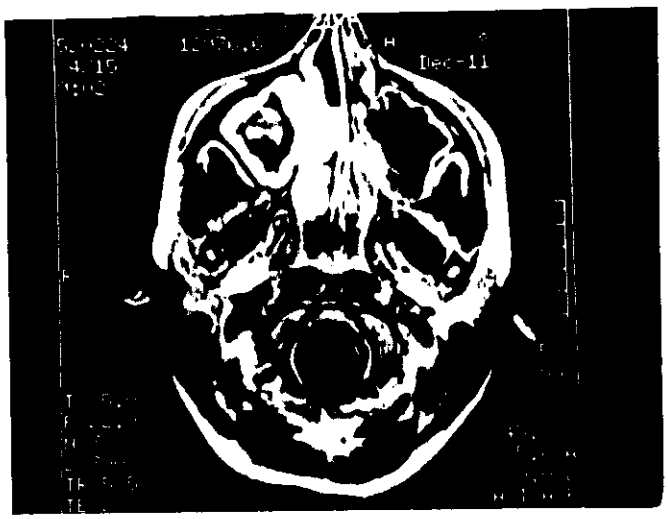
c) Axial T1-W image .

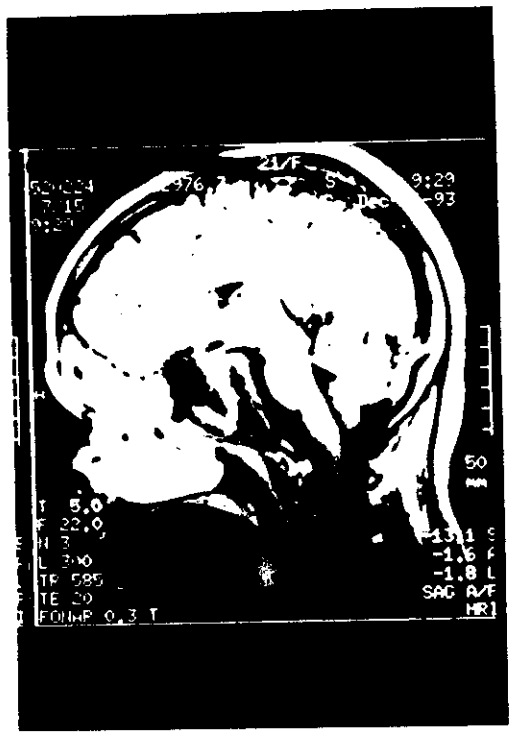


d) Axial T1-W image.



Continued Figure 12: Invasive Aspergillosis
e) Axial T1-W image post-contrast. f) Sagittal T1-W image post-contrast.

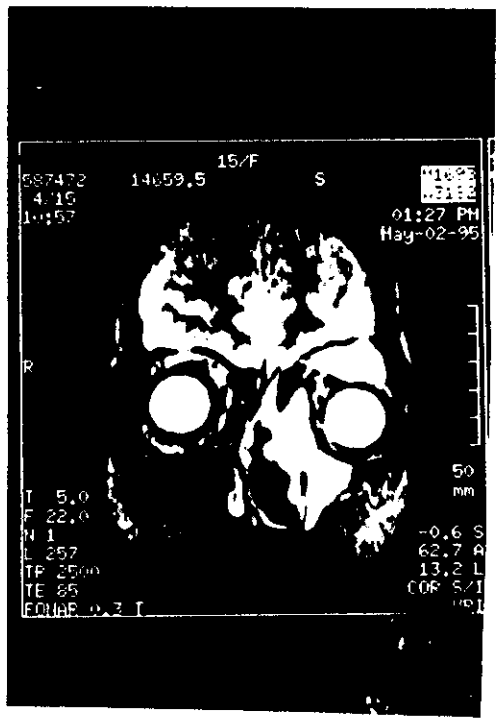




g) Coronal T2-W image.

Figure 13: Allergic Aspergillus Sinusitis

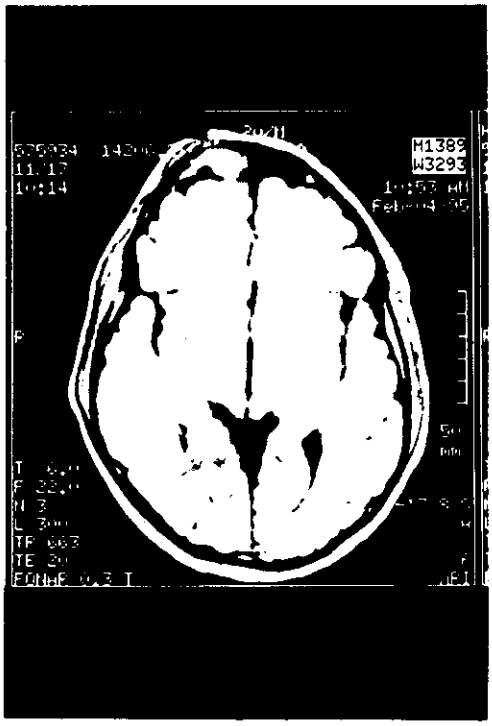
a) Coronal T1-W image. b) Coronal T2-W image.



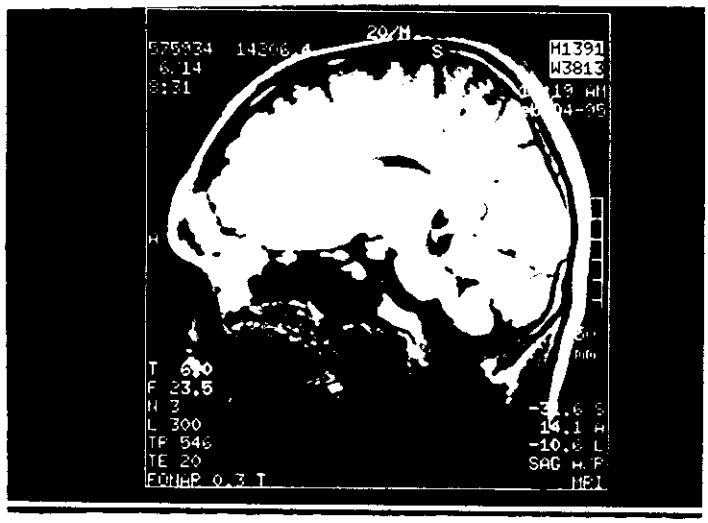
c) Coronal T1-W image following Gd- DTPA injection.

Figure 14: Right Frontal Pyocele

a) Axial T1-W image.



b) Sagittal T1-W image.



c) Axial T2-W image.

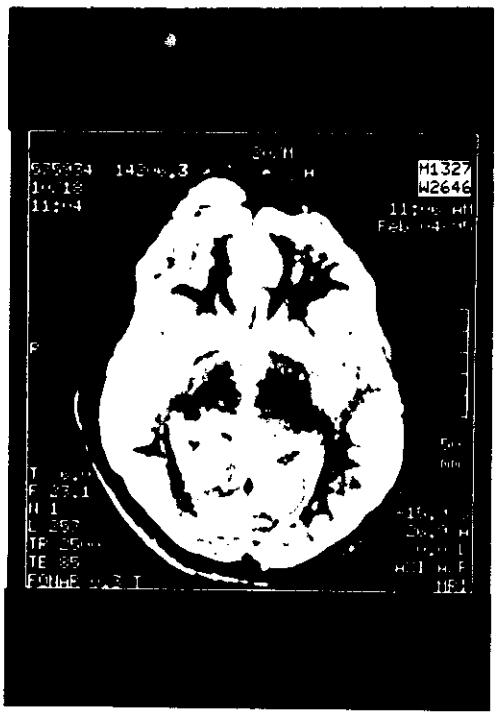


Figure 17: Empty Sella Syndrome

a) Coronal T1-W image post-cntrast.

b) Sagittal T1-W image post-contrast.

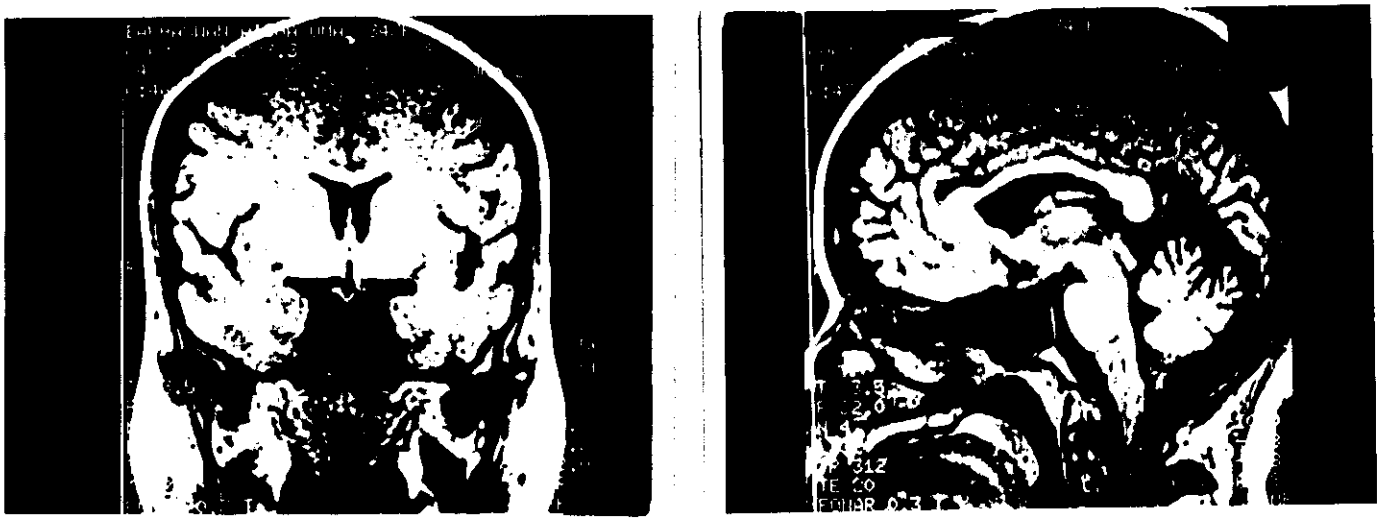
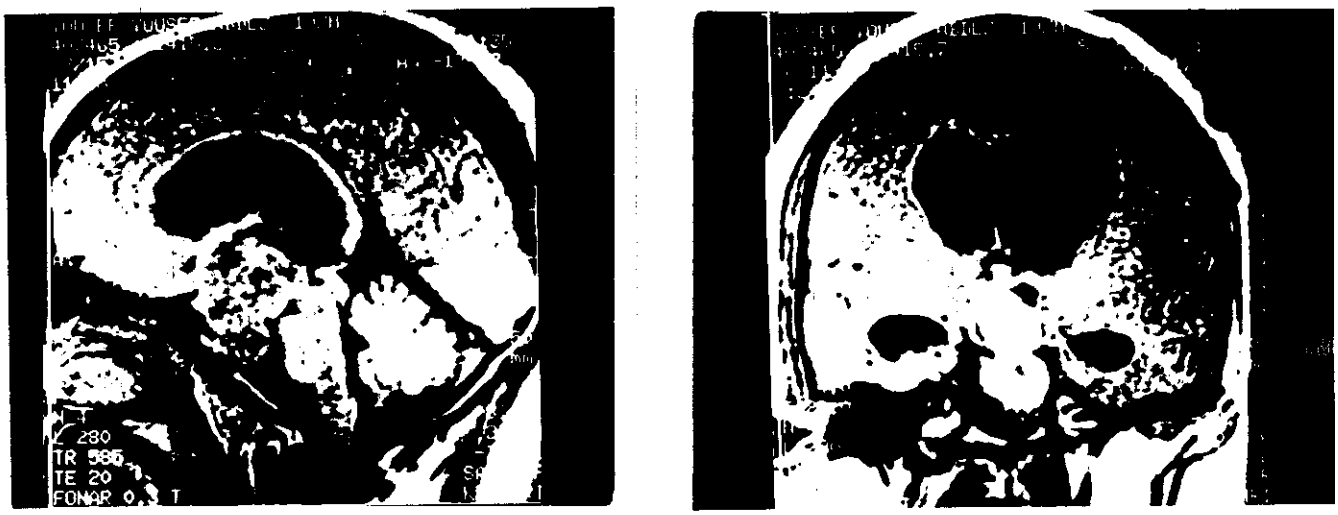


Figure 18: Craniopharyngioma

a) Sagittal T1-W image.

b) Coronal T1-W image post-contrast.



Throat

Case 1

A 34-year-old male complaining of right oral swelling and bleeding from the mouth of five months duration. History of right upper first premolar tooth extraction five months ago,one month later,he noticed the appearance of swelling on top of the tooth extraction site,which was compressible and easily bleed. On examination,3X3 cm soft swelling on the alveolus on top of right upper first premolar tooth which showed audible bruit over the mass.

CT scan showed no bony destruction of the alveolus but there was expansion of it. Angiography tried but not completed due to technical problem.

MRI of the facial region showed a diffuse soft tissue mass centered over the right alveolar margin and extending into the alveolar process at the site of the tooth extraction and occupying the upper lip. The mass was of iso-intense signal intensity in both T1- and T2- weighted images with areas of low intensity representing flow void vascular areas. The mass enhanced well in the iso-intense areas but the flow void areas remained the same.

(Table VII. case 2 / Figure . 19)

This appearance was consistent with **cavernous hemangioma of the maxilla**.

The patient underwent ligation of the right facial artery,intra-lesion injection of 20% saline and tissue biopsy,which came as cavernous haemangioma.

Case 2

A 34-year-old male complaining of loosen right lower teeth,odynophagia and oral swelling of four months duration. On examination,there was a fungating friable mass,arising from the right alveolar margin of the mandible. The parotid glands were bilaterally palpable. No neck lymph nodes could be palpated.

CT scan showed osteolytic bony lesion of the mandible extending to the floor of the mouth.

MRI for oral cavity showed iso-intense well-defined mass lesion originating from the mandible on the right side and extending into the oral cavity. The mass appeared of mixed hypo & hyper-intensity signal in T2-weighted image with positive patchy enhancement after gadolinium-DTPA injection. *(Table VII. case 3 / Figure . 20)*

Excisional biopsy was done and the result came as **ameloblastoma of the mandible**.

The patient underwent partial excision of the mandible and bone-grafting.

Case 3

A 79-year-old female referred from the E.R. complaining of severe headache which got worse by night and right ear pain for the last three weeks. She was known case of non-insulin dependent diabetes.

On examination,the right ear showed oedematous narrow meatus with granulation tissue filling the deeper part of the canal,the left ear was normal. Cranial nerves were intact. Fasting blood suger was 260 and ESR was 120. Right ear swab culture was Pseudomonas aregenosa.

CT scan of the base of skull showed no bony destruction with enhancing granulation tissue seen within the petrous bone. *(Table VIII. case 6 / Figure . 21)*

MRI showed iso-intense soft-tissue mass within the external auditory canal,middle ear,along the Eustachian tube up to the nasopharynx with clouding of the mastoid air cells in T1 weighted image. This lesion showed hyper-intensity signal in T2-W.

Following administration of contrast,there was widespread enhancement beyond the external canal involving the middle ear,Eustachian tube,infratemporal fossa and skull base.The patient was diagnosed as **malignant otitis externa.**

Case 4

A 46-year-old male who had headache,right visual deterioration,double vision,numbness along the distribution of 2 nd division of trigeminal nerve on the right side of the face and loss of appetite. On examination,there was right VI nerve palsy. MRI showed large lobulated soft tissue mass centered over the clivus causing its destruction and extending posteriorly to compress the brainstem. It showed high signal in T2-W image and heterogenous pattern of contrast uptake. It was consistent with **clival chordoma.**

(Table VIII. case 8 / Figure . 22) Tumour was resected successfully.

Case 5

A 30-year-old male was complaining of right nasal blockage,throat lump,throat irritation and fullness of the right ear. On examination,the right tonsil looked very large but without ulceration and crossing the midline. Anterior rhinoscopy did not show any abnormalities,the posterior one could not be done due to the obstruction of the view by the right tonsil. The right ear-drum looked dull and opaque. Audiogram showed right mild conductive hearing loss & left normal hearing. Tympanometry showed type B in the right ear and type A in the left ear.

CT scan and MRI of the naso&oropharynx showed a well-demarcated tissue mass filling the right parapharyngeal space creeping superiorly to the level of the nasopharynx on

the right side. The mass was seen filling the right fossa of Rosenmuller as well as the right eustachiane tube with its posterior border seen very close to the jugular & carotid vessels. Medially the lesion was seen pushing and bulging into the oro- & nasopharyngeal air-column causing its deformity,the mass extended down to the level of the epiglottis. The edges are well-defined. The lesion showed intermediate to high signal intensity in T1-W& high signal intensity in T2-W image and enhanced homogenously in post-gadolinium-DTPA series. No bony erosion as shown by CT scan. The lesion was measured 2.2x4.1x7.8 cm in length,breadth&height. There was an oval-shaped 2x1 cm soft tissue lesion of high signal intensity in both T1&T2 in the left submandibular triangle,most propably of cervical lymph node.
No intracranial extension. *(Table VIII. case 11 / Figure . 23)*

The patient underwent excisional biopsy,which came as poorly differentiated squamous cell **Carcinoma of the Nasopharynx**. The patient was referred for radiation.

Case 6

A 42-year-old male presented with bilateral neck swellings of more than one year duration which increased in size,repeated epistaxis,change of voice (nasal speech),right ear tinnitus and right facial pain. History of neck biopsy in other hospital.
On examination,there was an enlarged right upper cervical lymph node,hard,mobile,non-tender and scar of previous neck biopsy. Enlarged middle cervical lymph node was also felt on the left side. Examination of the post-nasal space revealed mass on the right side of the nasopharynx with bloody discharge. Throat showed fullness and diminshed mobility of the right side of the palate with deviation to the left side. The tongue showed fasiculations , atrophy &deviation to the right side. The gag reflex was weak. Corneal reflex was intact. There was lower motor neurone paresis of IX,X and XII cranial nerves on the right side. Ear examination showed right secretory otitis media. Audiogram showed right mild conductive hearing loss&left normal hearing. Tympanometry showed right flat curve &left normal curve. *(Table VIII. case 14 / Figure . 24)*
CT scan and MRI showed soft tissue lesion arised from the base of the skull mainly the right side, filling fossae of the Rosenmuller,Eustachian tubes,on both sides of the nasopharynx and distorted the naso-oro-pharyngeal air-column. It extends down into the oropharynx infiltrating the right parapharyngeal space,invading the right carotid sheath,reaching down to the level of the epiglottis. An intracranial extension was evident on the right side. The mass showed homogenous uptake of contrast and enhanced uniformly on T2-W image.

The patient underwent examination under anaethesia of the nasopharynx and multiple biopsies were taken which were consistent with **Non-keratinized Nasopharyngeal Squamous Cell Carcinoma**. The patient was referred for radiation therapy.

Case 7

A 65-year-old male presented with difficulty in swallowing and change in voice for 2-3 weeks , lump in the left side of the neck for many months and weight loss of about 10 Kg (within 3 weeks) . No history of nasal bleeding or impairment of hearing .

On examination,there was a left mass protruding in oral cavity,irregular surface,hard in consistency pushing the soft palate and uvula to the right side. There was left upper cervical lymph node,3x3 cm,mobile and painless. The nose & ears were within normal.

MRI showed a well circumscribed 6x4.5 cm left tonsillar mass which was markedly encroaching upon the naso-oro-pharyngeal air-column and left parapharyngeal space. The mass is highly invasive and crossed the midline to the other side, also, extending upwards to the nasopharynx to infiltrate the left lateral pharyngeal recess, torus tubarius, and the opening of the Eustachian tube. The left ascending pharyngeal artery looked obliterated. The tumour is infiltrating submucosally into the deep structures involving the retromolar trigone & base of the tongue on the left side. The lower limit of the mass is above the epiglottis. The mass showed iso-intense signal in T1- and high signal intensity in T2-weighted images. It showed homogenous contrast uptake after Gd-DTPA injection *(Table IX . case 15 / Figure . 25)*

The patient underwent an excisional biopsy which came to be poorly differentiated squamous cell **Carcinoma of the Tonsil**. The patient was referred for radiation.

Throat

A / Oral Cavity:

Table VII: Oral Cavity Lesions

Case No.	Diagnosis	Age/Sex Side	Symptom	T1-W	T2-W	Contrast	Biopsy Result	Rx.
I	Tongue Carcinoma	60 / F /Lt	Dysphagia	Hypo.	Hyper.	Enh.	+Ve	N.A.
II	Maxilla Haemangioma	34/ M /Rt	Oral Bleed.	Iso /S.V	+ /S.V	Enh. / S.V	+Ve	Medical
III	Ameloblastoma	34/ M /Rt	Odynoph.	Hypo.	- / +	Patch.Enh	+Ve	Surgical

Bleed.=Bleeding;Odynoph. = Odynophagia;Hypo.= Hypo-intensity;Iso.=Iso-intensity;S.V. = Signal Void;
Hyper.= Hyper-intensity;+ =Hyper-intensity;- = Hypo-intensity;Enh. = Enhanced;Patch. = Patchy;
N.A. = Non-applicable.

B / Nasopharynx :

Table VIII: Nasopharyngeal Lesions

Case No.	Diagnosis	Age/Sex Side	Symptom	T1-W	T2-W	Contrast	Biopsy Result	Rx.
IV	Adenoid Hypertrophy	3 / F	Snorring	Hypo.	Hyper.	N.A.	+Ve	Surgery
V	Adenoid Hypertrophy	35 / F	Snorring	Hypo.	Hyper.	N.A.	+Ve	Surgery
VI	Malignant Otitis Exter.	79 / F/ Rt	Rt Otalgia	Iso.	Hyper.	Enh.	N.A.	Medical
VII	Malignant Otitis Exter.	59 / M/Lt	Lt Otalgia	Iso.	Hyper.	Enh.	N.A.	Medical
VIII	Chordoma	46 / M	Headache	Hypo.	Hyper.	Het. Enh.	+Ve	Surgery
IX	Chordoma	36 / M	Headache	Hypo.	Hyper.	Het. Enh.	+Ve	Surgery
X	Nasopharyngeal Ca. *	43/ F/ Lt	Cervical LN	Hypo.	Hyper.	Solid Enh	+Ve	Radiation
XI	Nasopharyngeal Ca.	30/M/ Rt	Nasal Block	Iso.	Hyper.	Solid Enh	+Ve	Radiation
XII	Nasopharyngeal Ca.	63/M/ Rt	Cervical LN	Iso.	Hyper.	Solid Enh	+Ve	Radiation
XIII	Nasopharyngeal Ca.	75/M/ Lt	Cervical LN	Iso.	Hyper.	Het. Enh.	+Ve	Radiation
XIV	Nasopharyngeal Ca.*	42/M/Rt	Epistaxis	Iso.	Hyper.	Solid Enh	+Ve	Radiation

Exter.= Externa;Ca.=Carcinoma; * = Intra-cranial extension;L.N.= Lymph node;Hypo.=Hypo-intensity;
Iso. =Iso-intensity;Hyper.=Hyper-intensity;N.A.=Non-applicable;Enh.=Enhanced;Het.=Heterogenous;
+ Ve= Positive.

C / Oropharynx :

Table IX : Oro-pharyngeal Lesions

Case No.	Diagnosis	Age/Sex Side	Symptom	T1-W	T2-W	Contrast	Biopsy Result	Rx.
XV	Tonsil Carcinoma	65/M/ Lt	Dysphagia	Iso.	Hyper.	Solid Enh	+Ve	Radiation

Lt= Left;Iso.=Iso-intensity;Hyper.=Hyper-intensity;Enh.= Enhancement;+ Ve= Positive.

Figure 19: Cavernous Hemangioma of the Maxilla

a) Axial T1-W image post-contrast.

b) Coronal T1-W image post-contrast.

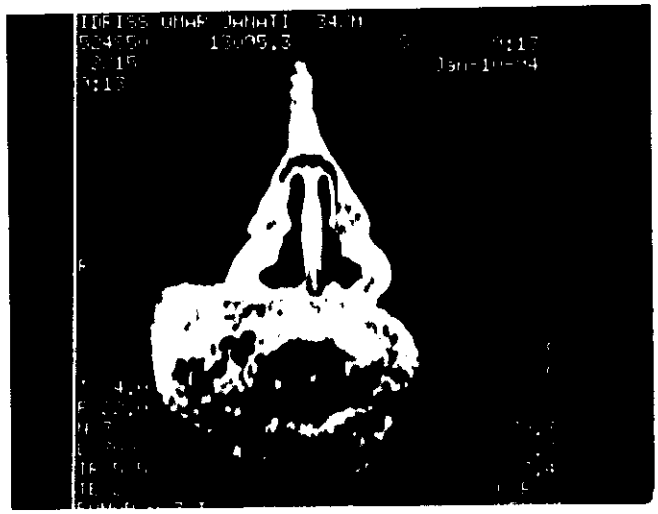
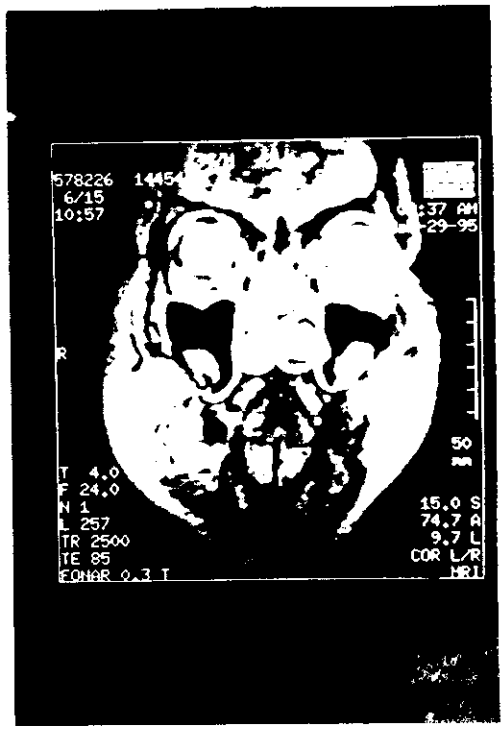


Figure 20: Ameloblastoma of the Mandible

a) Axial T1-W image.

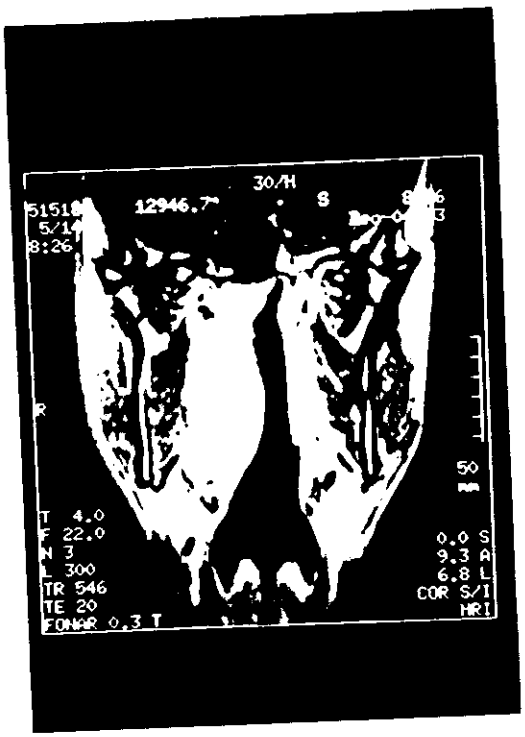
b) Coronal T2-W image.



c) Axial T1-W image post-contrast.

Figure 23: Nasopharyngeal Carcinoma

a) Coronal T1-W image post-contrast.



b) Sagittal T1-W image post-contrast.

Figure 24: Nasopharyngeal Carcinoma

a) Coronal CT scan (soft tissues).

b) Coronal CT scan (bone window).

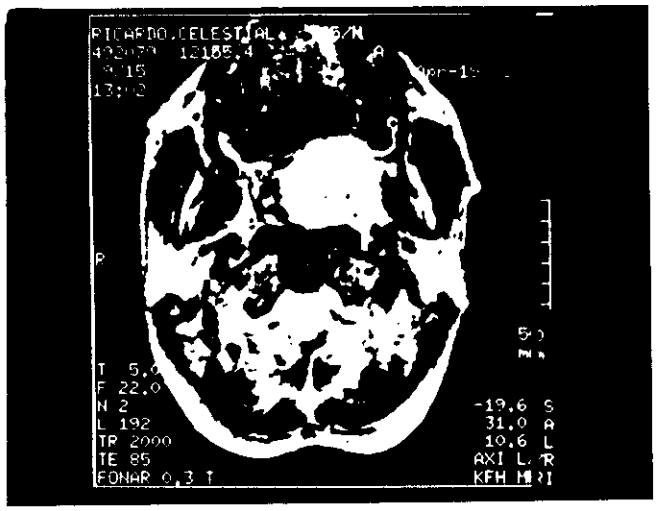
c) Coronal T1-W image post-contrast.

d) Axial T2-W image.

Figure 25: Tonsil Carcinoma

a) Axial T1-W image.

b) Axial T2-W image.



c) Axial T1-W image post-contrast.

d) Coronal T1-W image post-contrast.

Case 8

A 60-year-old female presented with inspiratory stridor,mild to moderate respiratory distress,for five months duration following open-heart surgery. She was known patient of non-insulin dependent diabetis mellitus,hypertension and ischaemic heart disease.

Fibre-optic nasopharyngoscpy was done which revealed normal freely mobile vocal cords and subglottic rounded mass. There was no palpable cervical lymph node in the neck.

MRI showed subglottic mass lesion almost obstructed the air-way which showed iso-intense signal intensity in T1- W & high signal intensity in T2-W image denoting its cystic nature. The diagnosis was compatable with **Subglottic Retension Cyst**.

(Table X . case 17 / Figure . 26)

The patient underwent microlaryngoscopy but unfortunately nothing was found and this could be explained by the rupture of the cyst by the endotracheal tube introduced by the anesthesiologist. After that the patient was free of symptoms.

Case 9

A 56-year-old male,smoker (60 cigarrete/ day for 30 year) presented to the E.R. with stridor for two days and hoarsness for four years. He had no dysphagia nor chocking.He was known case of chronic obstructive lung disease.

On examination,the patient was in mild inspiratory stridor.Indirect laryngoscopy showed that there was a mass obscuring the whole left vocal cord & crossing the anterior commissure to involve the right vocal cord. The false cords were also infilterated. The mass extended down into the subglottic area. There was left upper deep cervical lymph node enlargement.

MRI showed left side transglottic enhancing lesion invading the left thyroid lamina , crossing the anterior commissure to involve the right vocal cord and extending submucosally to the subglottic area. The mass showed intermediate signal intensity in T1-W & higher intensity in T2-W and enhanced homogenously after contrast.

(Table X . case 19 / Figure . 27)

The patient underwent tracheostomy and biopsy was taken which came compatable with invasive squamous cell carcinoma of the larynx **(Transglottic Carcinoma)**. The patient underwent total laryngectomy & selective neck block dissection operation.

Case 10

A 55-year-old male,a heavy smoker for the last 30 years, was complaining of dysphagia (to solids) for two months duration. He lost weight about 5 Kg. No history of hoarsness,stridor or chocking. The patient was a known case of diabetes mellitus,congestive heart failure,hypertension and post-myocardial infarction.
Indirect laryngoscopy showed fungating mass involved the base of the tongue more on the right than the left side,right vallecula and the pharyngeal surface of the epiglottis. Laryngeal crepitus was preserved. There was palpable right upper deep cervical lymph node. *(Table X . case 20 / Figure . 28)*

MRI showed that the pharyngeal surface of the epiglottis as well as the base of the tongue were infiltrated by intermediate signal intensity lesion in T1-weighted image and this lesion extended to the right vallecula and crossing the midline to the left one as well. This lesion had high signal intensity in T2-weighted image & enhanced smoothly after contrast. No infilteration to the pre-epiglottic space or down to the glottic reigon.

Microlaryngoscopy was performed which revealed the same findings detected by the MRI and the free vocal cords mobility.
Multiple biopsies were taken,the histopathology showed invasive poorly differentiated squamous cell carcinoma. So,the diagnosis was made as an extensive **Carcinoma of the Epiglottis**. Because of the associated multiple medical problems of the patient and the extensive surgery needed,radiotherapy was offered to the patient.

Case 11

A 3-year-old male child presented with facial swelling in front of the right auricle of two month duration which gradually increased in size especially with crying.
On examination,there was 5x 8 cm swelling in the parotid region of the right side of the face which caused elevation of the ear lobule,with soft to firm in consistency,bluish overlying skin,warm and feeble thrill over it. *(Table XI . case 21 / Figure . 29)*

MRI showed huge right sided parotid mass with intense branching vascularity as evident by the signal void intraglandularly,with its deep component of the lesion located in the parapharyngeal space. The right external jugular vein was encased within the tumour mass while the internal jugular and the carotid artery were seen displaced medially. Mass extended to the right infratemporal fossa. No intracranial extension.

The picture was in favour of **hemangioma of the parotid gland.** The patient recieved intra-lesion steroid.

Case 12

A 17-year-old female presented with painless swelling in front of the right ear extending behind the angle of the mandible for two months duration.

On examination,there was right parotid swelling, 4 cm in diameter,firm and not tender.

CT scan showed right sided soft tissue mass related to the posterior aspect of the parotid gland and was fairly outlined and showing no enhancing on contrast study.

(Table XI . case 22 / Figure . 30)

MRI of the neck showed homogenous enlargement of the right parotid gland which appeared of slightly higher signal intensity than the normal side with areas of low signal intensity in T1-weighted image. The lesion showed diffusely high signal intensity in T2 - W images with areas of low signal intensity. The fatty tissue around the gland appeared preserved with no evidence of infilteration. No evidence of enlarged lymph nodes. Homogenous uptake was noted after Gadolinium injection. The diagnosis was compatible with benign mixed tumour of parotid.

The patient underwent superficial parotidectomy. The histopathology came as **pleomorphic adenoma of the parotid**.

Figure 26: Subglottic Retention Cyst

a) Axial T1-W image .

b) Sagittal T1-W image.

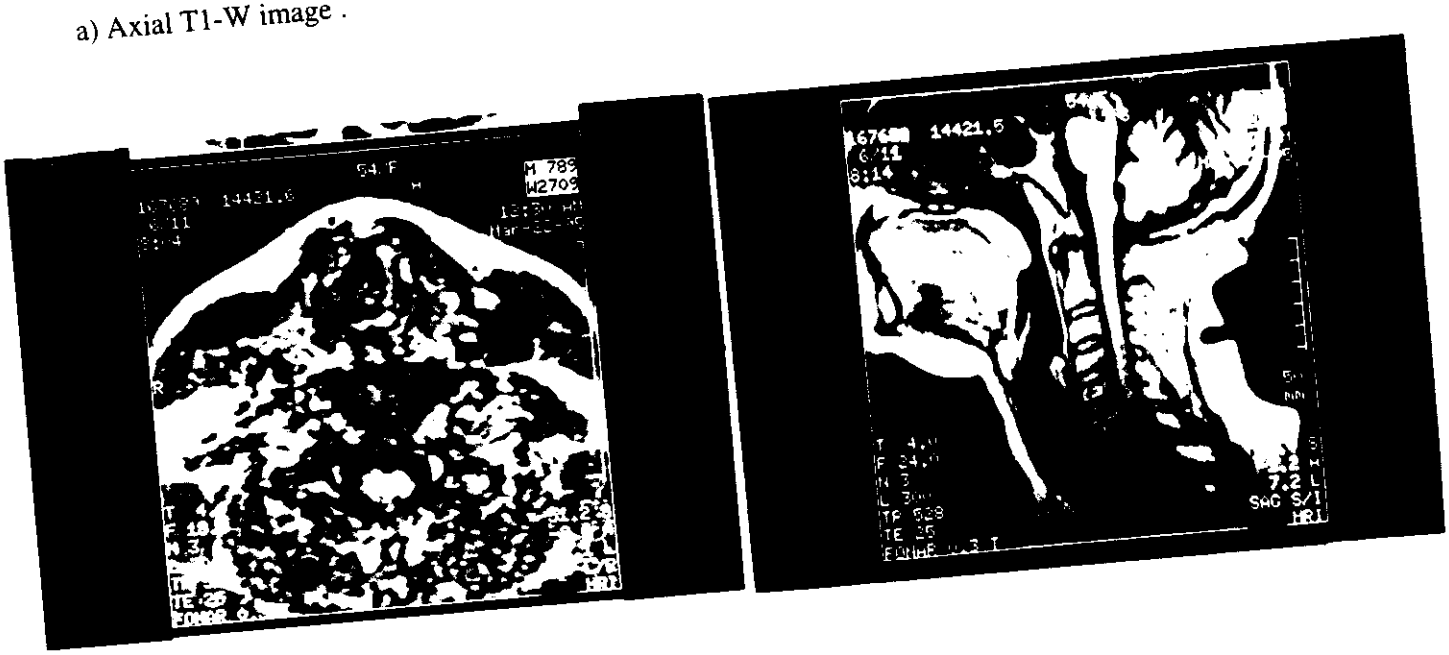


Figure 27: Transglottic Carcinoma of the Larynx

a) Coronal T1-W image .

b) Sagittal T1-W image post-contrast.

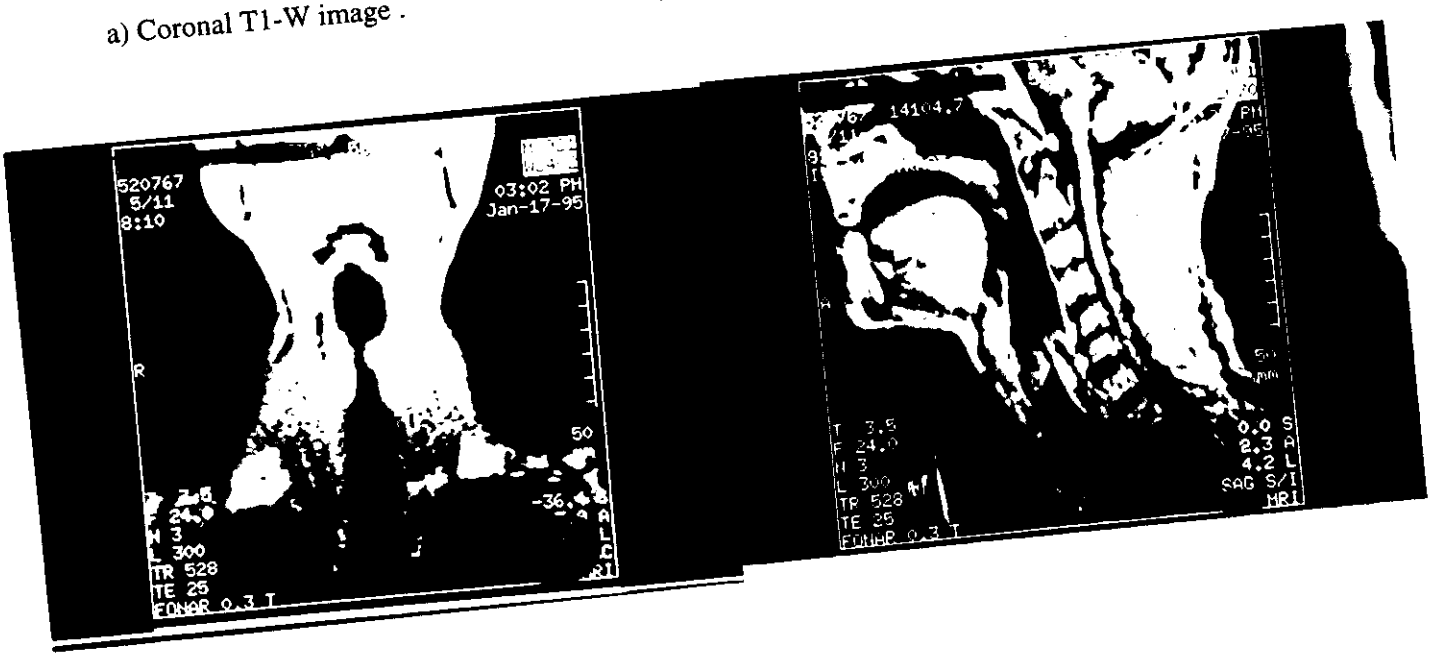
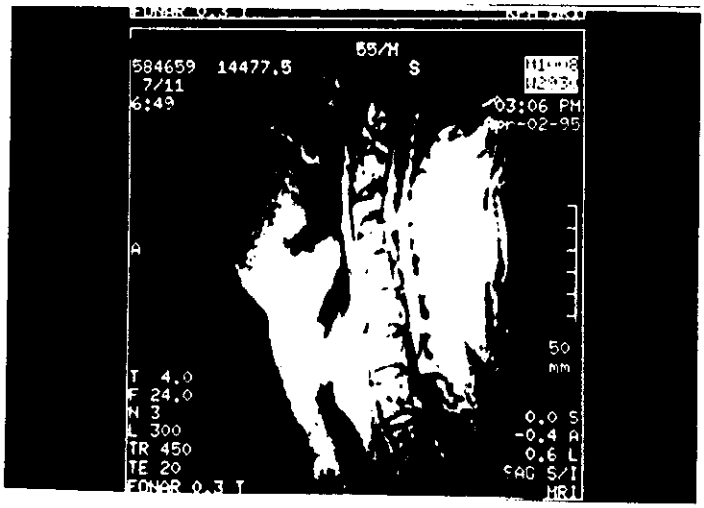


Figure 28:Epiglottic Carcinoma

a) Sagittal T1-W image.



b) Axial T1-W image post-contrast.

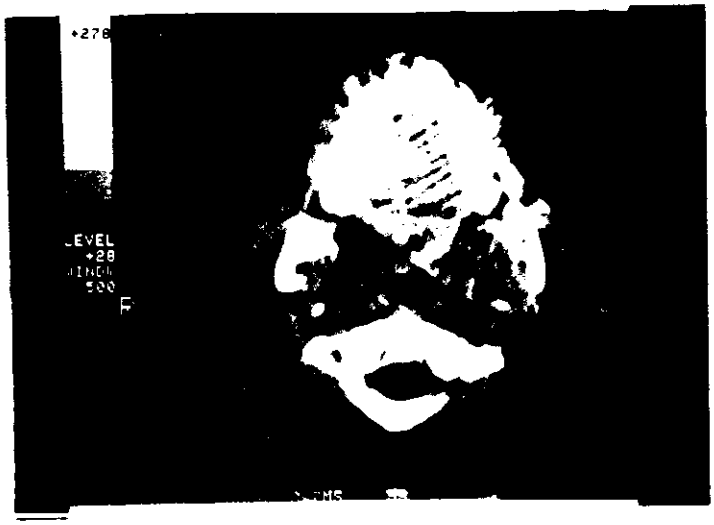
Figure 29: Hemangioma of the Parotid Gland

a) Axial T1-W image post-contrast.

b) Coronal T1-W image post-contrast.

Figure 30: Plemorphic Adenoma of the Parotid Gland

a) Axial CT scan with contrast.



b) Axial T1-W image.

c) Axial T2-W image.

d) Coronal T2-W image.