CARCINOMA OF NASOPHARYNX, A RACIAL GENITICAL TRANSMITTED DISEASE.

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Pharynx means "pass way". Nasopharynx means pass way of Air through the nose into the lungs. Air and Food are the two things which are necessary for life. Life can not be continued without Air and Food.

The essential Air for life is Oxygen, while the food must contain both water and other foods and Vitamins which are necessary for life. Life can not be survive without Air, foods and water.

Pharynx in Human beings consisted of 3 parts.

1. Nasopharynx is the Air passage through the noses.
2. Oropharynx is the passage of both the Air and Foods.
3. Laryngopharynx is the passage of foods through the posterior part of the larynx, or the Voice Box with its function for passage of the Air into the lungs and for speaking or making noises.

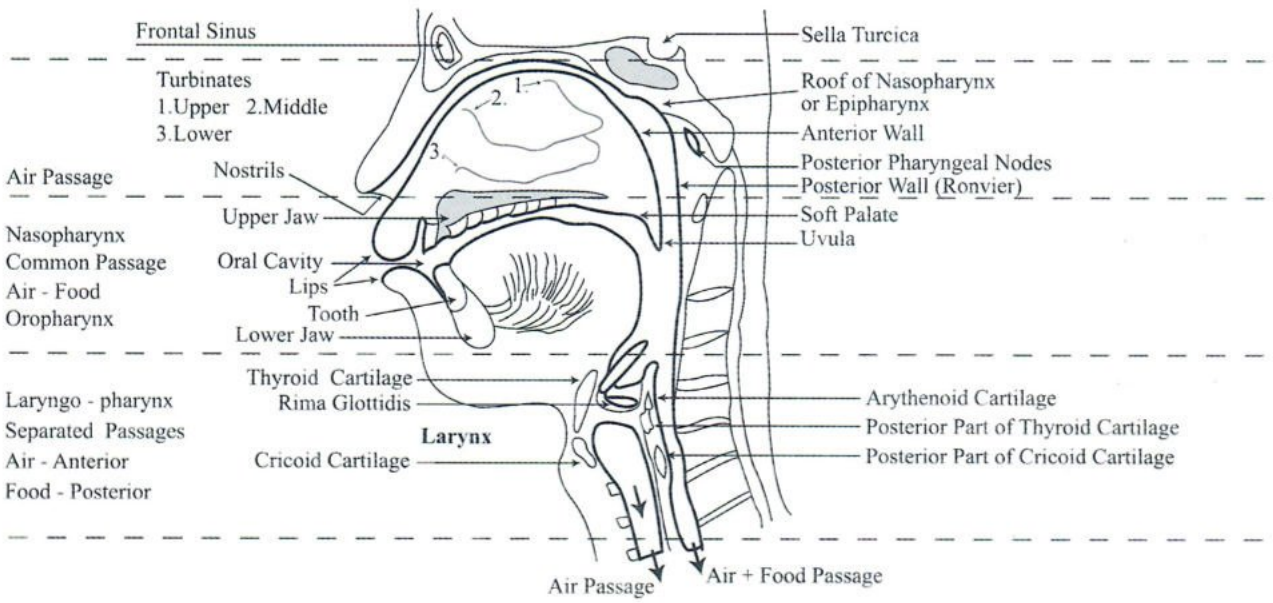

Fig.1 Picture showing Anatomy of Air and Foods passage into the body.

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Air passage starting from Nasopharynx, the air passed through both nostrils. The roof of Nasopharynx is the base of skull. Oropharynx is the common passage of air and food. Laryngopharynx is also the common passage of air and food. Laryngopharynx is divided into **air passage anteriorly** and **food passage posteriorly.** In swallowing of food the tongue will be moved posteriorly. Epiglottis will also be moved posteriorly to close the air passage and push the food into the laryngopharynx, and oesophagus respectively and finally into the stomach. While swallowing the food, epiglottic which is at the root of tongue will do the duty of closing the larynx to prevent the food droping into the trachea and pushing the food either solid or liquid into the oesophagus. If there is any food or water happened to drop into the larynx, and further into the air way, there remain the cough reflex to expel either solid or liquid out from the air passage before having a chance of getting into the bronchus and finally getting into the lungs. This is a natural defence mechanism which is responsible by the Autonomic Nervous System, to prevent food and water getting into the lungs causing pneumonia.

The Natural Defense Mechanism will control the food and water when swallowing to go into the right tract, i.e., Oesophagus and stomach not to go into the bronchus and lungs, and at the same time the breathing air into the air passages to have the exchanges of O_2 and CO_2 in the alveoli of the lungs, automatically. If there is excess of air entered into the stomach, it will be expelled out by Antiperistalisis automatically.

Before going into the detail of the disease, the normal anatomy of the Nasopharynx will be described briefly. Nasopharynx is an air passage shaped as 4 sided tube which have the roof as the base of skull. There are two anterior opening called the nostrils. The posterior end of the nasopharynx is also consisted of two opening, called the posterior nares. The air will be breathed through the anterior nares from both sides of the nose passing through the posterior nares into the Oropharynx, Larynx and both Lung. The posterior end of the Nasopharynx is continued by the Oropharynx. The posterior Nasopharyngeal wall is infront of the Anterior surface of the upper Cervical Vertebrae which is covered with the nasopharyngeal mucosa, there are two dimples one on the right and another one on left, which are called the Rosenmuller Fossae. On the lateral sides of these fossae, there is a small opening which is called the Rosenmuller Fossa,which is the opening of the connection between the middle ear and the Nasopharynx by a Eustachian tube. This special tube one on each side is very useful in keeping the equilibrium of the pressure in the middle ear with the Atomospheric pressure.

If there is cancer, benign tumour, inflammation with sticky pus causing obstruction of this Eustacian opening or canal, it will cause some strange noises called "Tinnitus". This condition if not properly treated, will end up with infection of the middle ear with pus known as "Otitis Media".

Symptoms: The symptoms of Ca. Nasopharynx may be classified according to the symptoms due to the position of the tumour mass.

1. Symptoms due to the tumour mass.

1.1. Air way obstruction causing difficulty in breathing:
Ask the patient to press his thumb on one of his nostril and take a deep breath through the other nostril once on each side. If there is a tumour mass obstreucted in one nostril, there will no air passing through the nostril of that side.

1.2. Epitaxis or Bleeding through the nostril of the affected side, from time to time.

1.3. Foul smell discharge or pus running through the nose or the throat from time to time, or coughing with blood and pus expectoration.

2. Symptoms due to Infiltration or Local invasion of Ca. Nasopharynx making obstruction of the Eustachian tube of

the affected side.

2.1. Impairment of hearing in the affected side of the tumour.
2.2. Tinnitus.
2.3. Partial Loss of Hearing.
2.4. Chronic Otitis Media of the affected side.

3. Symptoms due to Cranial Nerves Involvement.

3.1. Symptoms due to Paresis of Extrinsic Muscles making limitation of movement of the eye ball in the affected side, or Ptosis of the eyelid. The involvement of different cranial nerves cause different symptoms as followed:

Nerve II., making Ptosis due to paralysis of Levator Palpebrae.
Nerve III., paralysis making limitation of movement of eye ball.
Nerve IV., paralysis of lateral Rectus Muscle making Internal Squint.
Nerve VI., paralysis of Superior Oblique making the patient not be able to move the eye ball to see the object superiorly and obliquely above the head.

3.2. In having the paresis of the muscles which control the movements of eye ball, the eyes have to be accommodated in compensation all the time involuntarily which make the subject always have symptoms of headache.
3.3. Patient may have double visions.
3.4. In having the Internal Squint, making the patient lost the lateral visual field of the eye of that side.
3.5. The patient can speak some words not clearly due to the involvement of N. IV., Glossopharyngeal Nerve, making the paralysis of Pharynx and Uvula of that side.

If we ask the patient to open his mouth widely and say "Ah" the Uvula will be deviated to the side, opposite to the side of the paralytic nerve. Ask the patient to pushed out his tongue, the tip of tongue will be deviated to the side which the branch of N. VII. was pressed by the tumour.

4. The involvement of local lymph nodes.

Primary station of metastasis of Ca. Nasopharynx is the Node of Ronvier or Posterior Pharyngeal Nodes. These lymph nodes were located at the posterior wall of Nasopharynx which may be seen by nasopharyngeal mirror or direct nasopharyngoscopy and may be confirm by direct palpation by gloved finger at the posterior pharyngeal wall. It will be found that the posterior pharyngeal wall is lobulated with bulging enlargement of the posterior pharyngeal lymph nodes. Secondary station is the lymph follicles which is in the Inner Wal-de-year's Ring which may be palpable at the posterior triangle of neck and is the posterior group of Jugulo-Digastric and Jugulo-Omohyoid.

The next step of metastases is the spreading upward to the upper 1/3 of neck region and then spread downward to the lower cervical nodes, down to the clavicle and supraclavicular region.

5. Symptoms due to distant metastasis.

The predilection sites of distant metastasis of Nasopharyngeal cancer are Brain, Liver and Lungs. The general and local symptoms are the same as the Metastatic carcinoma which spread from the other primary sites of Cancer such as Head and Neck Cancer to the same metastatic sites.

Diagnosis. The diagnosis of Ca. Nasopharynx can be given only by a positive tissue biopsy reported from a qualified pathologist from the tissue biopsy taken from the mass in the nasopharynx, seen in the mirror or from a mass seen by direct nasopharyngoscopy. The Negative histological section does not mean that the patient have no cancer of the nasopharynx, if the clinical symptoms of the patient and

the result of clinical examination indicated that the patient is suffering from Ca. nasopharynx, e.g. there are multiple Cranial Nerves involvement. Re-biopsy should be done even the first biopsy is negative. There is a high percentage of Primary tumour of the Ca. Nasopharynx with a primary tumour very small, difficult to be seen or can not be palpable. Blind Biopsy is recommended to be done at least at the 3 predilected sites, namely at the Rosenmuller fossa and the opening of Eustachian Tube, secondly at the Posterior Wall and thirdly, the Lateral wall of the Nasopharynx, The physical examination of the Nasopharynx can be done easily by passing a catheter into one nostril and ask the patients to open his mouth widely and use a long forceps to pull the end of the catheter through the mouth and keep stabilized by a forceps, holding the two ends of the catheter together. Slowly pull the soft palate to one side, to open the clear view of Nasopharynx seen by the mirror examination without making the patient too much trouble. To avoid coughing or sneezing of the patient, local spraying of local anesthetic agents may be used at the nose and oral cavity.

Histological Types.

1. The most common histological type is Squamous cell Carcinoma with a varying degree of differentiation from well differentiated type to Undifferentiated or Anaplastic type.
2. Adenocarcinoma.
3. Adeno-acanthoma.
4. Lympho-epithelioma.
5. Lymphoma or Lymphosarcoma.
6. Tumour of Ectopic Salivary gland.
7. Plasmocytoma or Plasma cell sarcoma.

Treatment.

Ca. Nasopharynx is the central organ which surrounded by bony cages. The treatment by surgery is inadequate and impossible to take the primary lesion and its submucosal spreading adequately and remove en bloc., for curative treatment. Surgical procedure can be employed only for biopsy to prove that the lesion is cancer and what histological type with malignancy grading only. The adequate treatment or curative treatment could be done only by Radiation. The type of Radiation which aims at curative could be done only by External Radiation alone with high dosage wide and adequate fields of radiation covering the primary lesion and potential areas of lymph nodes in the head and neck region. Chemotherapy is recommended to use only in Lymphoma histological types only. Intracavitary Brachytherapy is recommended only, as an additional treatment in residual primary lesion in certain histological type such as Adenocarcinoma or Adeno -acanthoma. We recommended to use external radiation only using 6 MeV linear accelerator to have a high cure rate by delivering adequately high doses of radiation into the primary tumour area and the potential areas of metastasis in the head and neck.

Chemotherapy may be used as supplementary treatment or palliative treatment in rather late stages or palliative for recurrent cases according to general condition of the patient and the radiotherapist's decision that it is appropriate.

Principle of Radiotherapy.

Radiotherapy should cover by two lateral opposing fields from the Base of Skull down to clavicle, the upper border from the anterior end above the eye brow, the lower border down to cover the supraclavicular region. The posterior border of the radiation field, at the anterior border of Cervical vertebrae avoiding the cervical spinal cord so as the radiation field will cover the posterior pharyngeal wall to include lymph nodes and lymph follides at the posterior pharyngeal wall.

The third field may be added anteriorly to cover from the base of skull down to the hard palate for another 1000 rads. The addition radiation may be added in the cases of some histological types or grades which are known to be rather radioresistant. The supplementary radiation may be given either by External radiation, anterior direct field or by Intracavitary Brachytherapy to prevent or minimize the

complication of Radiation Myelitis and yet be able to diliver adequate doses to the tumour which is in the **bones cage.**

Total Doses of radiation depend on Histologic Sections. Squamous cell or Adenocarcinoma, the total dose may be high about 6500-7500 rads or centigray in 6.5 to 7.5 weeks. If still there is residual growth, followed up after 6-8 weeks after finished the first course of external radiation, Intracavitary Brachy therapy may be given as additional course by high dose rate, after loading applicators through the oropharynx.

The technique of radiotherapy for Ca. Nasopharynx aim to cover the Primary lesion and the Neck nodes to cover the potential areas of local spreading on bloc. The chemotherapy will be given or not depend on the decision of the physician and the histologic section, e.g. Lymphoma or lympho-epithelioma may be followed up by Chemotherapy.

The total doses of radiation in cases of Lymphoma may be given 4500 rads or cgy but lympho -epithelioma the radiation dose still have to be high up to 6500 rads, at least, the same as Squamous cell carcinoma followed by Chemotherapy or not, is up to the decision of the physician or the radiotherapist.

Fig.2 The examination of the Nasopharynx can be done easily by introducting a catheter into one nostril and ask the patient to open his mouth and use a long forceps to pull the other end of the catheter out from the mouth. The prevent the patient coughing or sneezing, use the local anesthesia to spray into the nasal and oral cavity before introducing the catheter into the nose.

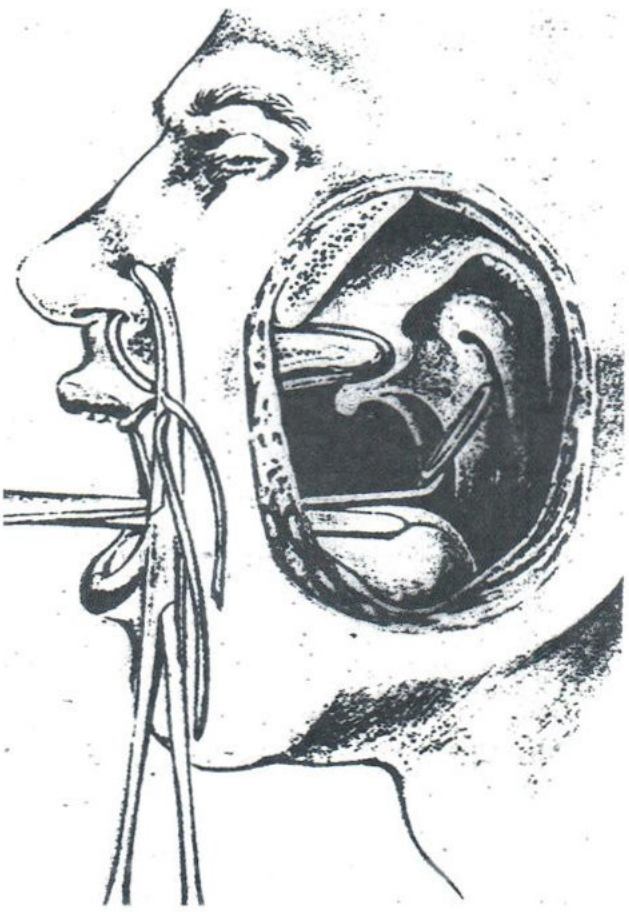


Fig.3 Hold both ends of the catheter to one side to open the clear view of the Nasopharynx without making too much trouble to the patient. Make a thorough examination of the Nasopharynx by the mirror as shown in the figure.

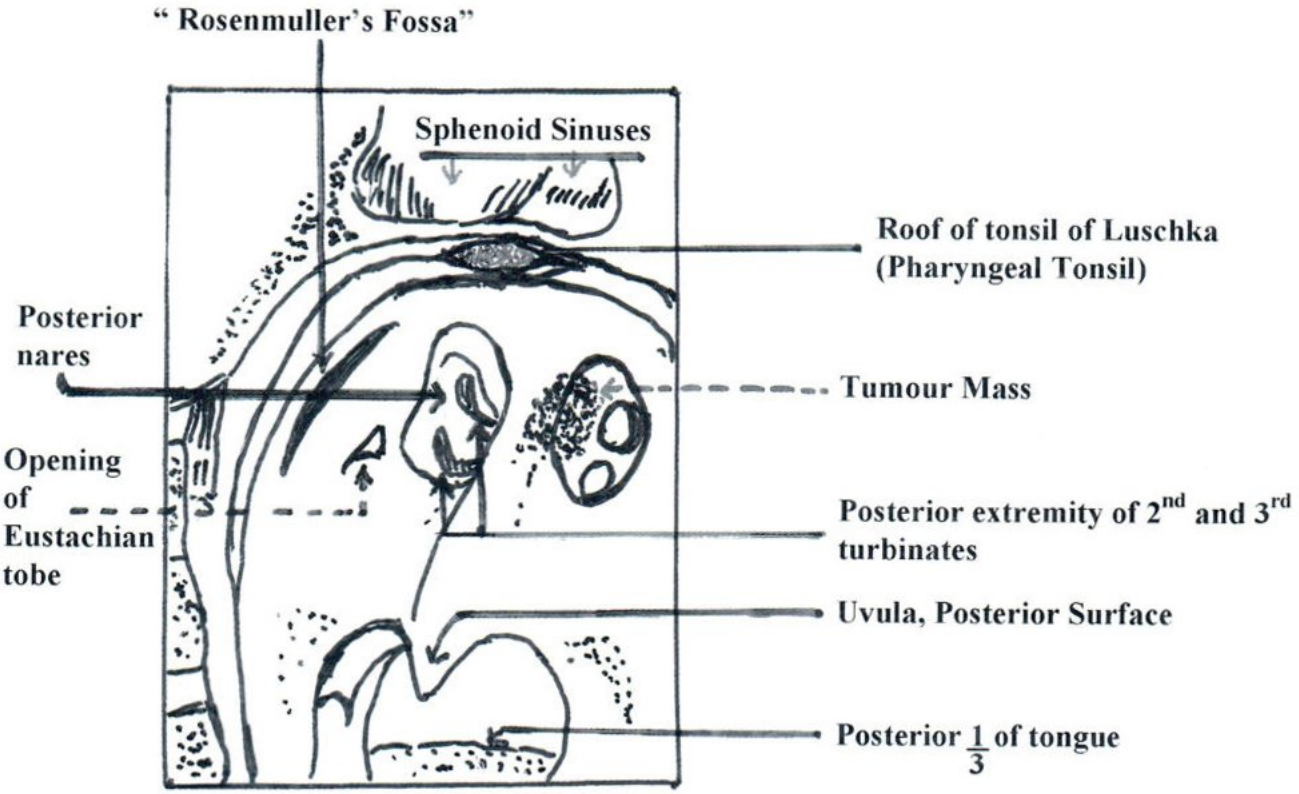


Fig.4 Nasopharynx seen by Nasopharyngoscope or mirror examination showing posterior nares, posterior extremities of 2nd and 3rd turbinates and opening of eustachian tube

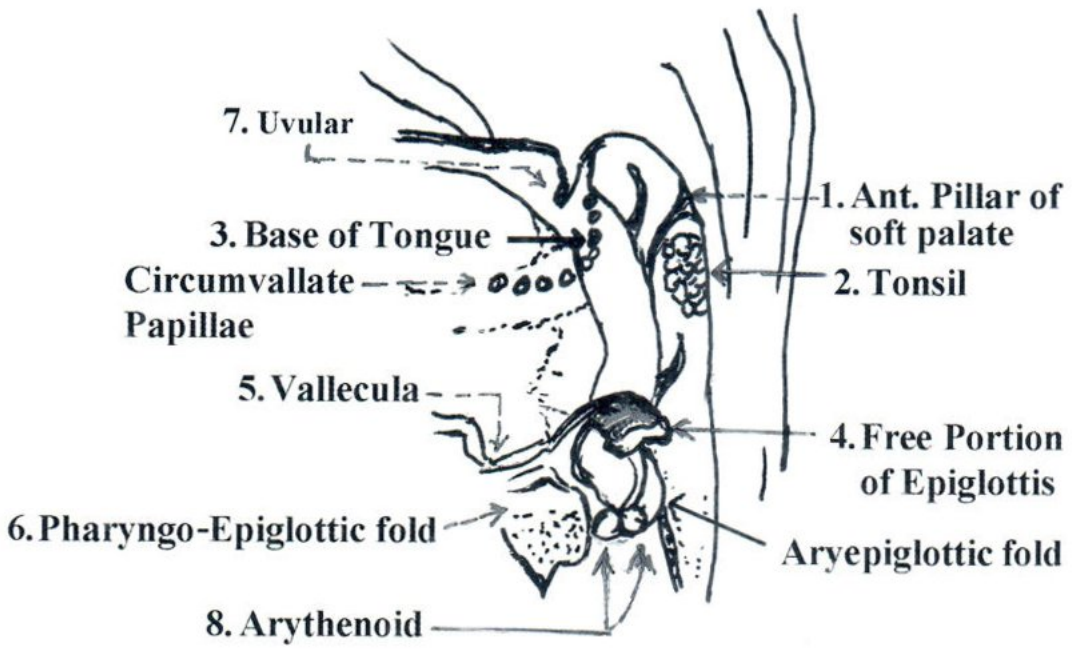


Fig.5 Postero-Lateral view of oropharynx

1. Anterior pillar of soft palate
2. Tonsil
3. Base of tongue
4. Free portion of epiglottis
5. Vallecula
6. Pharyngo-epiglottic fold
7. Uvala
8. Arythenoids

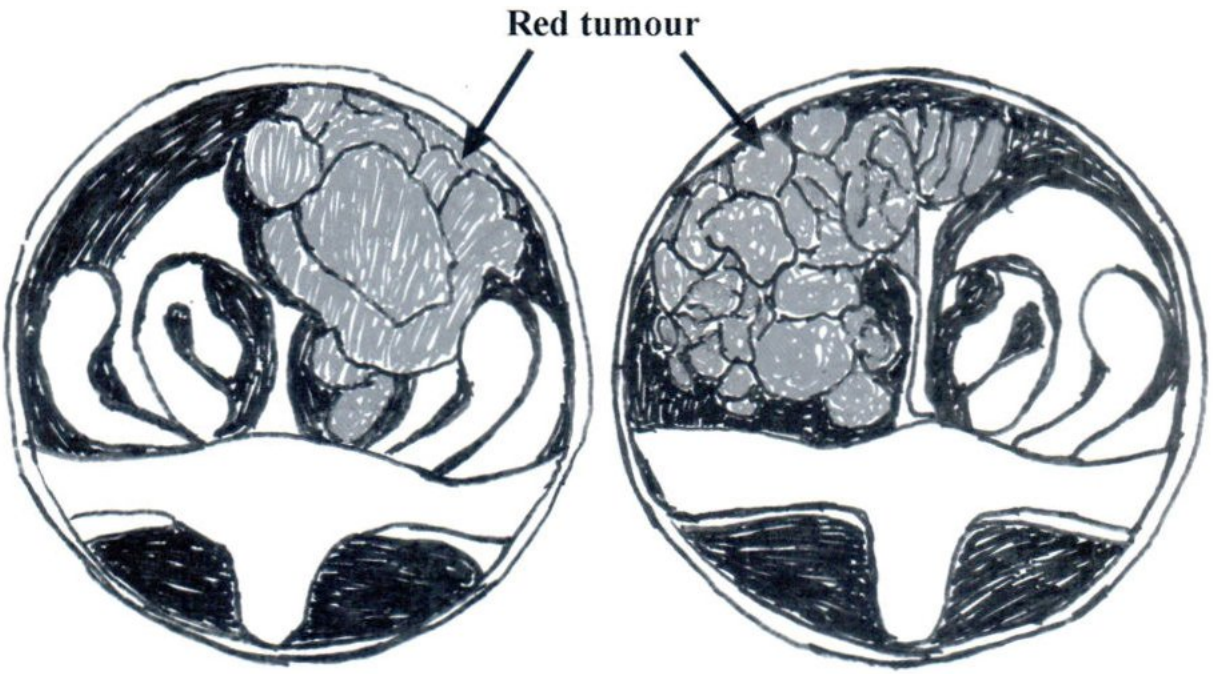


Fig.6A Fig.6B

Fig.6 Nasopharynx seen by Nasopharyngoscope or mirror examination showing posterior nares, posterior extremities of 2nd and 3rd turbinates. Red tumour is seen in each side of Nasopharynx.

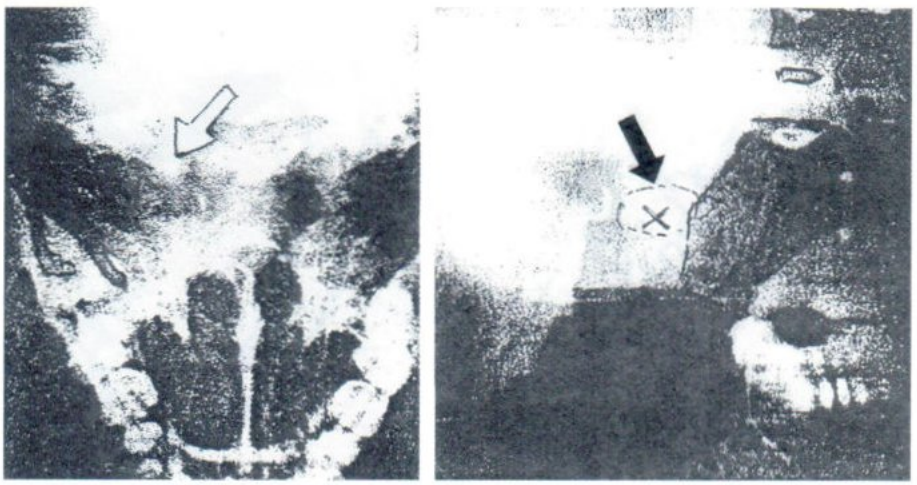


Fig.7A Fig.7B

Fig.7 X-ray picture of the base of Skull showing the erosion as pointed by an arrow at the Petrosphenoidal Region.

Fig.8A

Fig.8B

Fig.8A Widening of Posterior Wall showing the tumour mass in the Nasopharynx.

Fig.8B Tumour mass in the Nasopharynx.

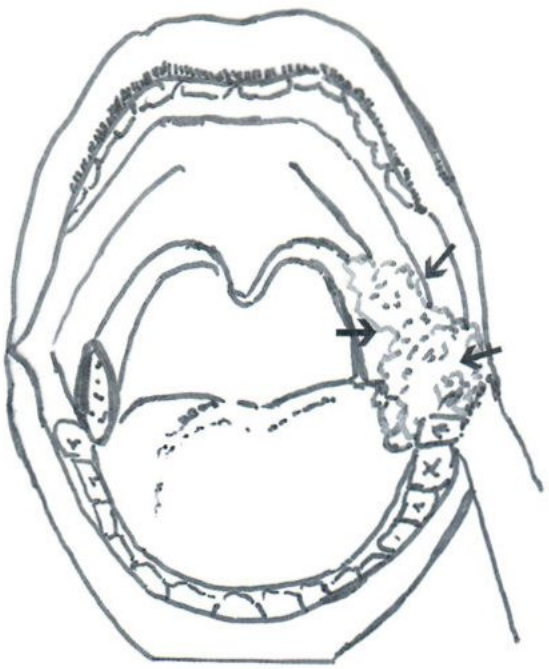


Fig.9 Papillary squamous cell ca. anterior pillar of soft palate spreading to base of tongue and buccal mucosa.

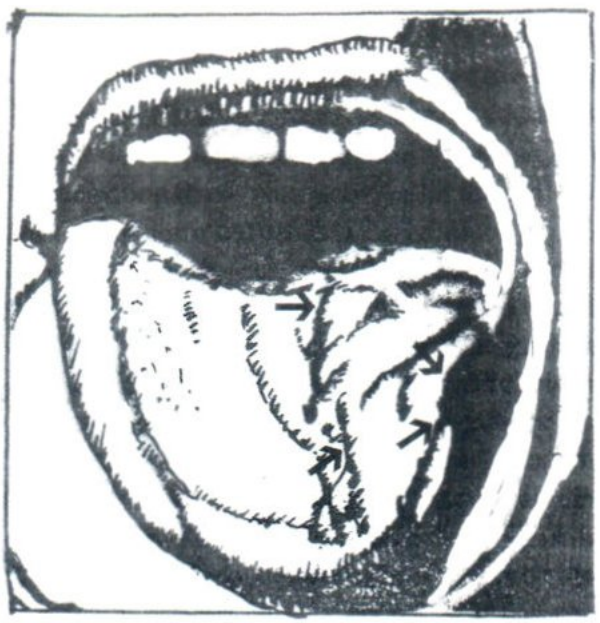


Fig.10 Hemiparalysis and atrophy of left side of tongue due to carcinoma of the nasopharynx involvement of the lateral wall of nasopharynx press on nerves and blood supply of that side.

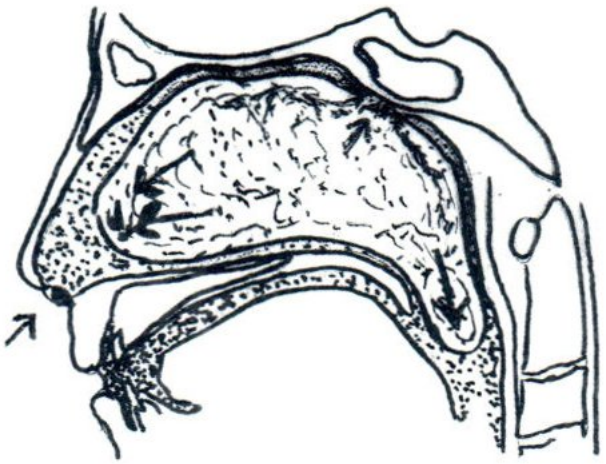


Fig.11 Nasophrayngeal fibroma showing the attachment at the base of skull in the form of pedunculated attachment and well-encapsulated extension toward the nasal cavity and oropharynx.

Fig.12 Nasopharyngeal fibroma protruding through Rt. Nostril in a child 12 years of age with bleeding on and off.

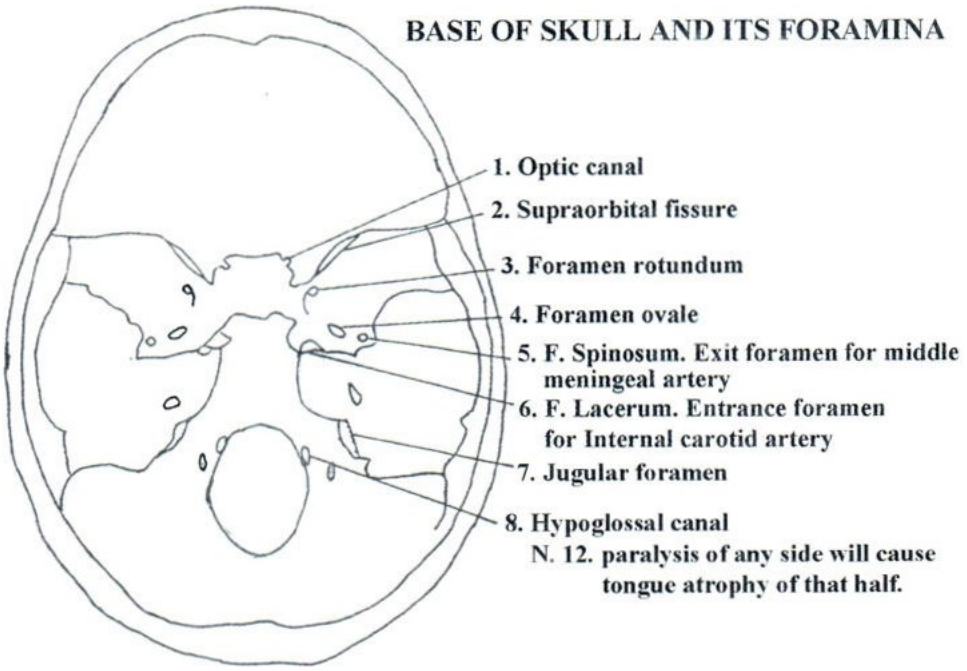


Fig.13

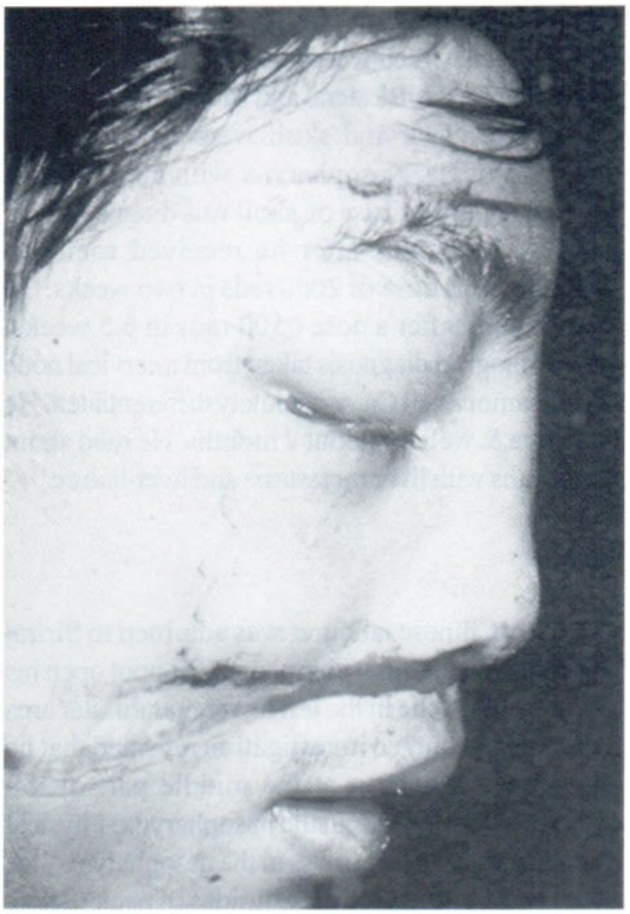
1. Optic canal for cranial nerve II (Optic nerve)
2. Supraorbital fissure for cranial nerve III, IV, VI, V_1 Occulomotor, trochlea, abducen, trigeminal first branch (Mandibular nerve)
3. Foramen rotundum for cranial nerve V_2 (Maxillary nerve)
4. Foramen ovale for cranial nerve V_3 (Ophthalmic nerve)
5. Foramen spinosum: Exit for Middle meningeal artery.
6. Foramen lacerum: Entrance foramen for Internal carotid artery
7. Jugular foramen: for CN X, IX, XI
8. Hypoglossal canal: nerve XII. Paralysis of any side will cause tongue atrophy of that half

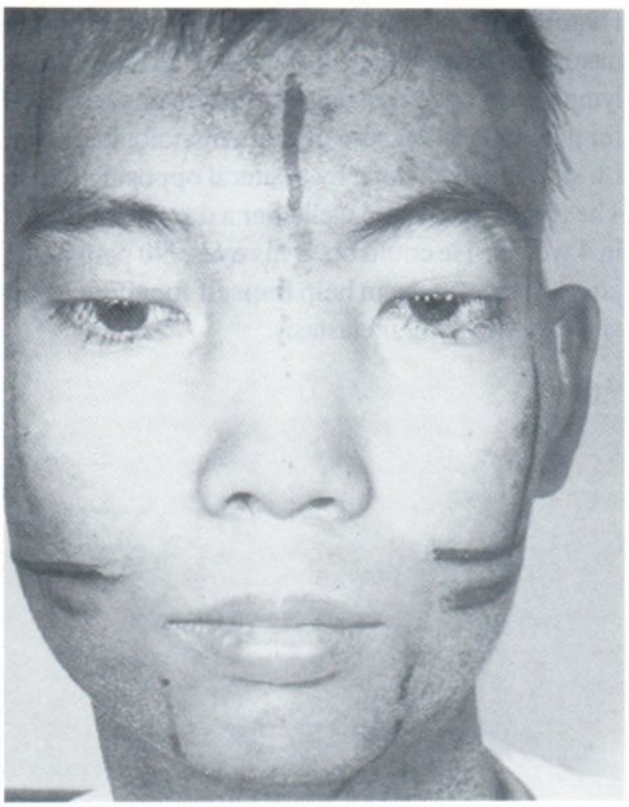
Nerve V Trigeminal nerve: Sensory+motor nerve, sensory 3 branches
1. Handibular N.
2. Maxillary N.
3. Ophthalmic N.

Motor nerve supply Mastication muscles:

1. Optic Canal is the pathway of optic nerve to supply the Levator Palpebrae Muscle causing Ptosis of that side.
2. Supra orbital fissure is the pathway outlet of Cranial Nerve, Oculomotor N III, Pineal or Trochlea N IV., Abducen N VI., Trigeminal Nerve, branch I., Mandibular N.,
   Nerve IV, Trochlea supplying Superior Oblique N.
   Nerve VI Abducen supplying Lateral Rectus
   Nerve V Mandibular branch supplying Lateral Rectus, and supplying Muscles of Mastication; Median, Lateral Pterygoid and Masseter Muscle.
3. Foramen Rotundum, Nerve 5., branch II., paralysis cause numbness at the maxillary prominence.
4. Feramen Ovale, Nerve 5 branch III., Irritation of this branch cause pain at the floor of orbit, pain and numbness of the tongue of the affected half including the floor of mouth and buccal mucosa.
5. Foramen Spinosum, exit foramen for middle meningeal artery.
6. Foramen Lacerum, the entrance foramen for internal carotid artery.
7. Jugular Foramen N.9, 10, 11. Ask the patient to say "Ah" the Uvula will be deviated to the non-paralytic side.
8. Hypoglossal Canal, damages to N. XII., there will be atrophy of the tongue of that half which is affected.

Before treatment





After treatment

Case I.

A Chinese patient was admitted to the Siriraj Hospital in Thailand for I day with the chief complaint of unconscious for 2 days with foul smell discharges running through both nostrils. The left eye was not fully closed with exposure keratitis. He could not close his mouth tightly and both lips were not fully closed. We can see the pus in the mouth, mucopurulent with blood stained discharge through his half-opened lips. He was treated by antibiotics and supportive therapy with I.V. fluid and Vitamins.

At the same time we have given him radiation therapy by external radiation to the Head & Neck by two lateral opposing fields with a daily dose of 200 rads/day, 1000 rads/week at midline to the Head & Neck Region. The upper border of the field cover the base of skull. The lower border of the field cover the upper 2/3 of neck node region. The

radiation field cover the primary lesion in the Nasopharynx which was diagnosed by physical and X-ray examination. Lateral and Mento-Vertex Views of Head & Neck and skull were taken and the diagnosis of Ca. Nasopharynx with metastasis to cervical nodes and base of skull was diagnosed. He gain his conscious after he received roentgen treatment for a dose of 2000 rads in two weeks. He recover fully after a dose 6500 rads in 6.5 weeks. The histological diagnosis taken from a cervical node was squamous cell Ca. moderately differentiated. He was alive & well for about 7 months. He died about 8.5 months with liver metastasis and liver failure.

Case II

A Chinese labourer was admitted to Siriraj Hospital with the chief complaint of cannot open his eyes and toothache in the left lower mandibular area for 2 days. Roentgen investigation revealed that he had bone destruction at the middle part of left mandible and big mass in the nasopharynx. Physical examination revealed a mass in the nasopharynx with neck node enlargement in both sides of neck region. Histological biopsy of the primary lesion in the nasopharynx revealed moderately differentiated lymphosarcoma. Local radiation treatment were given for palliation to the base of skull, mandibular region Lt. side and neck node by bilateral opposing fields. The patient recovered well after a dose of 4500 rads in 4 weeks. He could open his eyes. No pain in the jaw, left side, and can help himself for about I year and died with liver metastasis.

Before treatment

After treatment

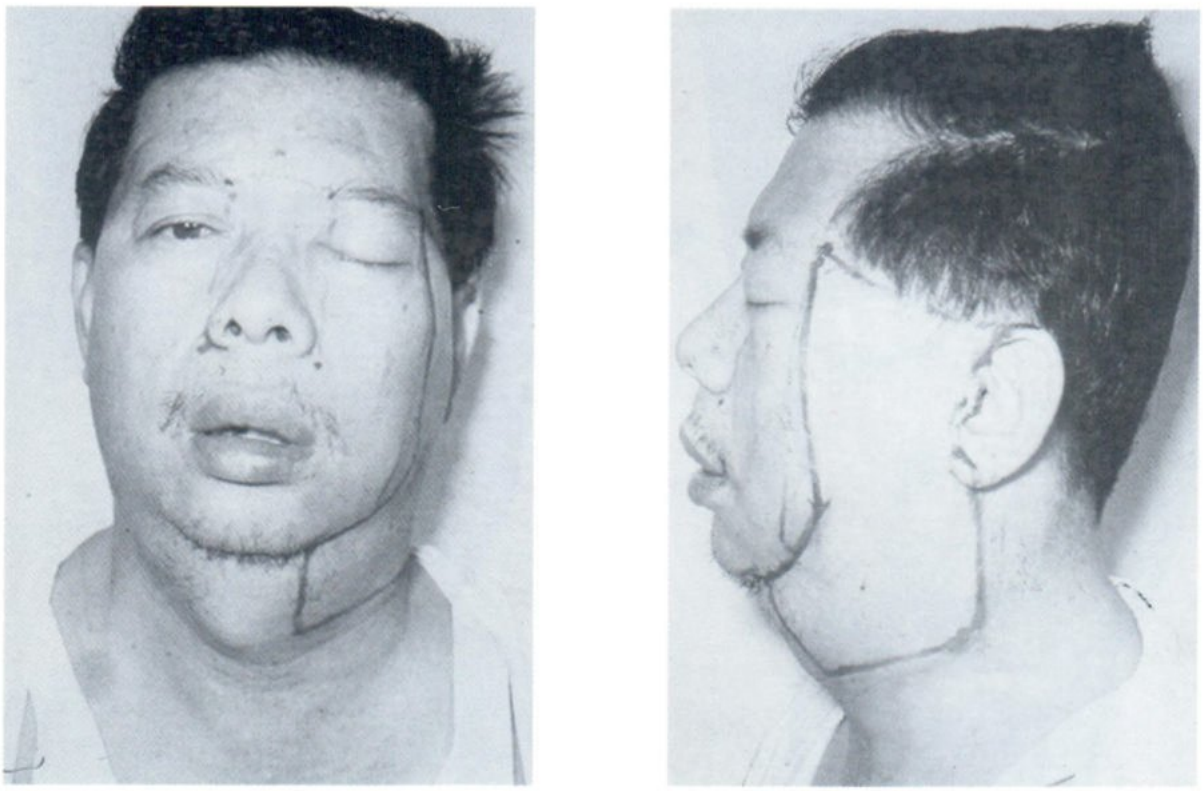
Case III

A case of lady, 35 years of age having a car accident about 6 months previously. She drove a motorcar and had a collision accident with the other car, having been treated in Siriraj Hospital. She recovered well with a scar of the injury and a scar of the previous suture in the forehead which healing up well. She came back to the hospital with a complaint of not be able to open her right eye with ptosis. Investigation was done and found that she was having Ca. Nasopharynx with a mass in the Rt. side of Nasopharynx. Mento-vertex view of the skull showed a big mass at the base of skull Rt. side. Nasopharyngeal biopsy was taken by direct Nasopharyngoscopy and found to have a lympho-epithelioma. Roengent treatment was given by 6 MeV. Linear accelerator for a dose of 6500 rads. After 4 weeks with a dose of 4000 rads, She can open up her right upper eye lid, She had completed her radiation treatment with a dose of 6500 rads with the complication of having the falling off her hair from her head. She survive and well after 4.5 years and had lost the followed up. The skin reaction had a complete healing and her hair had grown up as normal in 6 weeks after the radiation treatment had been completed and finished.

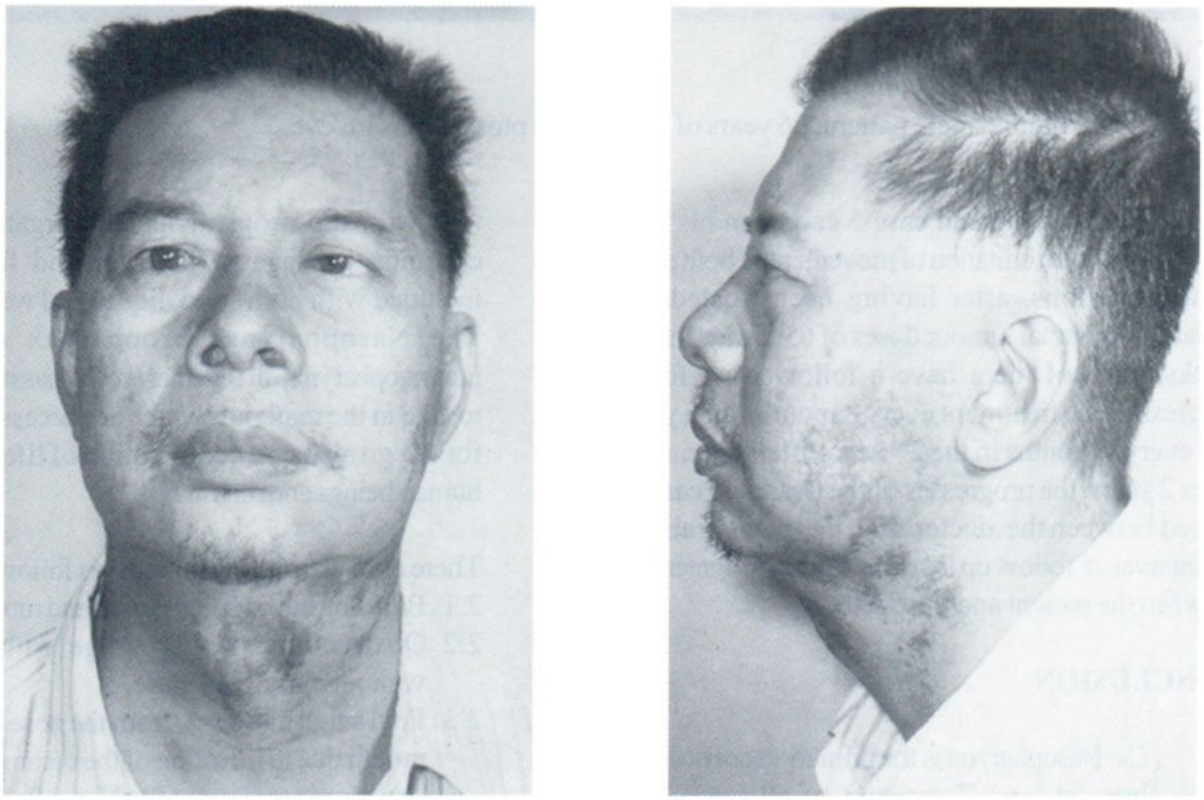
Before treatment

After treatment

Case III 4 week After treatment she have fallen hair from her head, with skin reaction. The skin reaction had healed up 6 weeks after treatment, and the hair had grown up as normal again.



Case IV A Chinese male patient 42 years of age **before treatment,** having ptosis of his left eye.



Case IV After treatment, he can open both eyes after a dose of 6500 rads.

Before treatment **After treatment**

Case V A Chinese, male patient, 26 years of age, he had ptosis of his Lt. eye.

Both, case 4 and case 5 can open his eye fully and without limitation of movement of both eyes in all directions, after having been treated by radiation for a total tumour doses of 6500 rads in 6.5 weeks. Both of them have a followed up for a progress of the treatment every 3 months for a year and every 4 months in the 2nd years after treatment. After 2 years. the progresses of the treatment can be agreed between the doctor and the patient about the interval of follow up that is convenient, agreeable between the patient and the doctor.

CONCLUSION

1. Ca. Nasopharynx is the primary cancer which have at least 7 varieties of all types and involving the organ of air passage in continuation with the orophanynx, the organ of common passage of both air and food included with both solid, liquid and water. The Nasopharynx, Oropharynx and Laryngopharynx, all together are the passages to take in the materials which are necessary for the growth and continuation of life for human beings and mammals.

2. There are 5 alarming symptoms as followed:
   - 2.1 Bleeding through the nose or/and mouth.
   - 2.2 Obstruction of air passage with or without mass in the nose.
   - 2.3 Foul smell discharge from the nose and mouth due to infection of the ulcerative or necrotic tumour in the Nasopharynx and its extension.

2.4 Headache due to cranial nerves involvement and especially the motor branch of Trigeminal nerve. The involvement of the motor branch of Trigeminal nerve making paralysis or weakness of the intrinsic muscles for the movement of eyeball of the involved side. This paralysis or paresis causes the patient have to accommodate the two eyes all the time to see any object or to talk with other people and this is the cause of headache.

2.5 Ptosis of the upper eye lid of the aftected side due to the tumour involvement of the optic nerve and especially the branch which supply the muscle Levator Palpebrae. Mento-Vertex View of the skull will show involvement or bone destruction, especially the optic canal which is the path way of optic nerve from the skull.

3. Carcinoma of the Nasopharynx can be treated radically only by super voltage radiotherapy at least 6 MeV machine, because it is the cancer mostly needed high doses of radiation of at least 6500 rads or centigrays.

4. Curative treatment can be treated radically only by super voltage X-ray machine by an experient radiotherapist. It need a high dose of at least 6500-7000 rads in 6.5-7 weeks. The tumour dose lower than this or the treatment duration is longer than 7 weeks will end up with recurent or distant metastasis.

5. The chance of being cured in this cancer of the Nasopharynx could be attained only in stage I, II, stages later than this can be treated only palliatively to decrease the undesirable symptoms and extend a longer life.

6. Surgical or chemotherapy can not be used for currative purposes.

7. Carcinoma of the Nasopharynx, the primary site is under the base of skull and the posterior border is infront the cervical spinal cord, radical treatment can not be done by either surgery or chemotherapy, the only radical or curative treatment can be done only by radiotherapy with an experient team of Radiotherapists, Radiation Physicist and Radiographers. Otherwises, only palliative treatment can be done.

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Section IV Head+Neck, Chapter 14-20 (all in Chinese Language)

Chapter 14 Nasopharyngeal Cercinoma: An Analysis of 790 cases.

Chapter 15 Preliminary Experience with HDR Brachytherapy for 72 Nasopharyngeal.

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Chapter 18 Intracavitary Brachytherapy Combined with External Beam Therapy for Naropharyngeal Carcinoma.

Chapter 19 Selectron-LDR After loading Combined with External Radiation for Naropharyngeal Carcinoma.

Chapter 20 Preliminary Experience with External Beam Ivabiation Combined with micro-Selectron. HDR Braclrytherapy for Naropharyngeal Carcinoma: Reperton 28 Patients.