Paparella III: Section 1: Diagnosis of Disorders of the Head and Neck

Chapter 1: Physical Examination of the Head and Neck

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Adequate examination of the head and neck, particularly the upper aerodigestive tract, presents a unique challenge, as much of the area to be examined is not easily accessible to direct visualization. A certain skill and deftness is, therefore, necessary to master the specialized instrumentation required to assess all the areas adequately. Diagnosis is the key to patient care, and no surgical skill can compensate for an inability to adequately assess and evaluate a patient. Every area must be examined, no matter how awkward, frustrating, and time-consuming, as most errors in diagnosis are errors of omission for which there is no excuse. A system, therefore, must be developed in both the history taking and clinical examination to minimize the possibility of missing the underlying pathologic condition.

An unfortunate consequence of this age of superspecialization is to isolate the examination of the head and neck from that of the rest of the body. This should be discouraged, and when performing a head and neck examination, one should always be cognizant of the other areas of the body. Therefore, a thorough medical history and complete examination of the rest of the body should always be performed as indicated.

History Taking

History taking is a skill that requires learning, like any other aspect of medicine or surgery. Time should be devoted to history taking. The age-old saying that the patient will tell you the diagnosis holds as true to diseases of the head and neck as to other areas of the body. One must make sure that patients feel at ease and are allowed to tell their story in their own words first. Patients must not be rushed and words must not be put into their mouths. Certainly, they must not be confronted with a barrage of specific questions until they have completed their own story. Each of us has experienced the frustration and irritation of the patient who strays from the relevant history. Gentle guidance soon puts them back on track. One must not be in a hurry! The key is for the patient to feel comfortable with the physician, and the time spent on the clinical history is well worthwhile so that a rapport may develop.

Positioning for Examination

Examination of the head and neck is usually performed with the patient sitting in front of the physician, with the physician either standing or sitting depending on the facilities available. The patient should sit upright and should not slouch in the chair. Constant repositioning of the head is necessary to obtain adequate visualization of the various areas. If the patient is sitting in an electrically operated chair, it too may need to be repositioned in order to maximize the view. In this day and age, it is probably advisable to wear gloves and a mask during physical examination, particularly if the mucous membranes are to be examined.

Illumination

Since the head and neck surgeon spends most of his or her life peering down dark, relatively inaccessible orifices, good illumination is essential for adequate examination. Various options are available to facilitate this examination: (1) a reflecting head mirror with a light source, (2) a head light, and (3) specialized illuminating instruments, including fiberoptic ones. Familiarity with all instruments is ideal because different clinical situations may necessitate different light sources.

The reflecting *head mirror* with a separate light source is the time-honored and traditional method used in most otolaryngologic units. It is initially difficult to learn to use, but once mastered it is an excellent method of illumination. It is, however, somewhat cumbersome and in many institutions has been replaced as the technique of choice by the electric head light. The lamps must be bright (150-watt clear bulb) and the head mirror should have a focus of 10 to 12 inches. Any longer focus is difficult to work with.

A *head light* provides excellent illumination and is the preferred method of many practitioners. It is certainly considerably easier to use, and with the development of the new lightweight head lights and the high-intensity halogen lights, together with a small battery operated power source, the popularity of this instrument has increased considerably.

Fiberoptic endoscopy for evaluation of the larynx, nasopharynx, the paranasal sinuses, and even the trachea, bronchi, and esophagus is commonly used in an outpatient setting, particularly if the areas cannot be adequately visualized using more standard techniques. Certainly the fiberoptic laryngoscope and nasopharyngoscope are not standard equipment in most offices.

Various *illumination rods* have also been proposed for examining and photographing the larynx and nasopharynx. Although they are convenient to use and are certainly less expensive than the fiberoptic instruments, they have their own set of limitations, including difficulty being tolerated by the patient and not being as successful in allowing the larynx and nasopharynx to be visualized. Diagnostic endoscopy of the nose and paranasal sinuses is increasing in popularity, and as experience grows it may become a useful adjunct to clinical evaluation.

Instrumentation

Specialized instruments are required for adequate examination, for example, nasal specula, tongue blades for the oral cavity, and nasopharyngeal and laryngeal mirrors. They all come in various sizes, and a full array is needed. A method should also be available to prevent fogging of the mirrors, for example, an antiseptic solution or a warming device such as an alcohol lamp. If a flame is to be used, the temperature of the back of the mirror should always be tested to avoid burning the patient's mucosa. A local anesthetic spray and topical decongestant may also be needed to facilitate the examination.

As already discussed, a host of flexible and rigid endoscopes have become available for patient evaluation. These additional instruments are *not* essential to a routine head and neck examination; however, they are extremely helpful in certain instances. An added advantage of these instruments is the ability to photograph the pathologic features through them, which, of course, is ideal for documentation.

Examination of the Neck

A thorough knowledge of anatomy of the neck is essential for adequate examination. A systematic approach is necessary in order to avoid missing any pathologic findings. One should avoid honing in on the obvious swelling and neglecting the rest of the neck examination. The approach to the examination of the neck should be carried out as described in the following paragraphs.

Inspection

One must always take a few moments before commencing palpation to inspect the neck. This may provide vital information. Note any scars or asymmetry, as well as whether there is any limitation of movement. Look for any abnormal masses that may be better seen than palpated, for example, a thyroid mass or a soft cystic mass. A laryngocele may only be seen on Valsalva maneuver and may not be palpable.

Palpation

There are two approaches to palpation of the neck, that is, from behind and from the front. Examining the neck from behind is less awkward and enables the examiner to palpate both sides simultaneously, allowing comparison. The patient should be seated with the neck slightly flexed. This relaxes the musculature and makes palpation easier.

Transillumination

The technique of transillumination is, unfortunately, a forgotten art, but it is occasionally useful in differentiating solid from cystic structures. The room should be darkened and an intense light placed against the swelling. A cystic hygroma will transilluminate brilliantly.

Auscultation

Auscultation of the neck should be performed routinely in order to detect audible bruits in carotid stenosis or vascular tumors.

The Cervical Lymphatics

The anatomy of the cervical lymphatics is dealt with in detail elsewhere in this book; however, for purposes of clinical evaluation, it is useful to categorize the cervical lymph nodes

as occurring in an upper and lower horizontal chain connected by a vertical chain. The upper chain consists of submental, submandibular, facial, preauricular, postauricular, and occipital nodes, whereas the lower supraclavicular chain consists of pretracheal, paratracheal, supraclavicular, and posterior triangle nodes. These chains of nodes are connected by lymph nodes running along the length of the internal jugular vein, which are divided arbitrarily into upper, middle, and lower groups. In the examination, therefore, one should systematically palpate first the upper and then the lower horizontal chains anteriorly to posteriorly, followed by the vertical chain. The relationship of the sternocleidomastoid muscle to these vertical groups of nodes should be noted. This muscle will need to be displaced anteriorly or posteriorly to adequately palpate the nodes. Using this approach, all node groups will be palpated except for the Delphian nodes, which are located over the cricothyroid membrane, requiring a special effort to palpate them. Cancer of the larynx may spread to these nodes. The situation, size, number, and consistency of the nodes should be noted and recorded. Much can be determined from the consistency of the nodes - that is, metastatic cancer feels hard, lymphoma feels firm and rubbery, and hyperplastic nodes are softer. Interestingly enough, metastatic malignant melanoma is often very soft to palpation.

The Thyroid Gland

Once the lymphatic system has been assessed, attention should be directed to the thyroid gland. Frequently, the gland can be better seen than palpated and, therefore, a moment should be taken to look at the neck in profile. In most individuals, the gland is barely palpable, but if it is enlarged one should note if it is a smooth, diffuse, or nodular swelling. Furthermore, if it is nodular, it should be determined whether it is a single nodule or multinodular. If a single nodule is palpated, but the rest of the gland is enlarged, one must be aware that this probably represents a dominant nodule in a multinodular goiter. If doubt exists as to whether the mass is truly thyroid in origin, the patient should be asked to swallow and it should be determined whether the mass moves. Signs of compression of regional structures may be obvious, for example, displacement of the trachea, carotid arteries, or jugular veins. If the lower aspect of the gland cannot be palpated above the suprasternal notch, retrosternal extension should be suspected, particularly if there are signs of superior mediastinal syndrome, for example, cervical venous engorgement and facial edema.

The Major Salivary Glands

At this stage, the paired parotid and submandibular glands should be evaluated. This requires not only palpation of the neck but also an intraoral examination to inspect the duct openings and, in the case of the submandibular glands, to bimanually palpate the glands.

The *submandibular glands* are easily palpable in the submandibular area. In older patients, they tend to be lower and more prominent in the neck and, therefore, may be mistaken for a tumor. The best method of assessment is by bimanual palpation, with one finger in the floor of the mouth and the other in the neck. Intraoral inspection and palpation of the submandibular (Wharton's) duct is necessary to evaluate saliva flow and consistency and to palpate for a

calculus.

The parotid glands are easily palpated in the neck, but the deep lobe escapes adequate assessment, as it lies in the parapharyngeal area. For this reason, in evaluating the parotid gland, the oropharynx should be inspected for any distortion of the lateral walls. One should not forget to examine the parotid (Stensen's) duct opening onto the buccal mucosa opposite the second upper molar tooth.

The Larynx and Trachea

Next, the laryngeal skeleton is palpated. One should feel for the trachea in the suprasternal notch and then follow it up to the more prominent cricoid cartilage. The cricothyroid membrane then becomes obvious. This is an important landmark, as it is the site through which an emergency cricothyrotomy is performed. The thyroid cartilage is then palpated, with the prominent thyroid notch being obvious. The hyoid bone is easily palpable just superior to the thyroid notch.

Once these major structures have been evaluated, the rest of the neck needs to be assessed in an orderly manner. Knowledge of the anatomy of the skin and subcutaneous tissue and the position of the underlying muscles, nerves, and blood vessels is essential. In addition, one must never forget to evaluate the cervical spine by palpation to determine whether there is a full range of movement without any discomfort or limitation.

Evaluation of the neck performed in this orderly manner should make diagnosis of any mass relatively simple. As one examines a lump in the neck, the following questions should be asked:

1. What structure is it arising from?
2. Is it a lymph node?
3. If not, is the mass arising from a normally occurring anatomic structure in the area, for example, nerve, blood vessel, muscle?
4. Could it be arising from an abnormally occurring anatomic structure, for example, a laryngocele, pharyngocele, branchial cleft cyst, or cystic hygroma?

Once the anatomic site of origin has been established, the pathologic diagnosis should be considered, that is, is the cause congenital, inflammatory, traumatic, neoplastic, degenerative, or idiopathic?

Using this approach, very few masses will elude diagnosis.

Examination of the Oral Cavity and Oropharynx

All too often the oral cavity and oropharynx are inadequately examined, with most medical students being taught to insert a tongue depressor blindly into the patient's mouth and

ask the patient to say "ah", which results in a glimpse of the oropharynx. This then constitutes the complete examination. This is patently not adequate and a systemic approach is necessary.

Before commencing examination of the oral cavity proper, the patient is asked to remove all dentures, whether partial or complete. There should be no exceptions to this rule in spite of the amazing reluctance of many patients to comply with this request.

Lips

By definition, the lips are regarded as part of the oral cavity. The lips should first be inspected for any distortion or asymmetry of movement, then they should be palpated between thumb and forefinger in order to detect any submucosal masses that may not be visible.

Buccal Mucosa

Using two tongue blades, or one tongue blade and a gloved finger, the buccal mucosa is examined first on one side then on the other. The parotid duct openings are identified and saliva flow is determined by milking the parotid gland while observing the duct.

Teeth and Gingiva

The teeth and gingiva should be inspected for any obvious abnormality. If the gingiva bleeds easily on palpation, the possibility of subacute or chronic infection should be suspected. The teeth should be tapped gently in order to determine whether this maneuver elicits any pain indicative of underlying infection. More detailed discussion regarding evaluation of the teeth will be found elsewhere in the text.

Floor of the Mouth

By asking the patient to elevate the tongue, the entire U-shaped area of the floor of the mouth can be examined. Inspection reveals the frenulum in the midline, with the openings of the submandibular ducts on either side. Pressure on the submandibular glands will provoke a visible flow from these ducts. The sublingual glands are visible beneath the mucosa, and on the ventral surface of the tongue submucosal varicosities are often found. A bony protuberance (torus mandibularis) arising from the inner table of the mandible can achieve variable size and is a common finding. Bimanual palpation of the floor of the mouth will allow the submandibular glands to be felt in their entirety.

Tongue

Anatomically, the tongue consists of the base (posterior one third) and the mobile portion (anterior two thirds). Even with full protrusion, only the anterior two thirds is clearly visible. The tongue should be assessed both in its natural position in the mouth and during protrusion. Lesions of the base of the tongue may be suspected if the patient complains of dysarthria or an inability

to protrude the tongue fully. The base of the tongue is best visualized using a mirror, but it can be palpated in most individuals. The circumvallate papillae between the base and anterior two thirds of the tongue are often misinterpreted by both patients and physicians as representing pathologic lesions. Likewise, the lingual tonsils may vary in size and may mimic malignancy. Conversely, the anterior two thirds of the tongue is easily visualized and palpated. One must not forget to inspect the ventral surface of the tongue.

Hard and Soft Palate

The hard palate can be adequately examined only if the patient is asked to tilt his head backward. A torus palatinus is a frequent finding and may be misdiagnosed as a tumor. The soft palate is then inspected by depressing the tongue with a tongue blade. The mobility of the palate can be assessed by getting the patient to say "ah". Asymmetry in movement should be looked for. The junction of the hard and soft palates should be inspected and palpated, looking for evidence of a submucous cleft. In this condition, the mucosa may look normal, but a notch rather than the spine will be palpated along the posterior aspect of the hard palate in the midline.

Oropharynx

The whole oropharynx, with the exception of the base of the tongue, can usually be adequately visualized if the tongue is depressed. In performing this maneuver, one must avoid placing the tongue blade too far posteriorly, as this will result in gagging. Initially, the area should be evaluated as a whole, looking for any obvious asymmetry that may be due to a pathologic condition in the oropharynx proper or parapharyngeal space, which will distort the oropharynx.

After examining the soft palate, the tonsils should then be assessed. They may vary considerably in size, particularly in children, but are usually equal and symmetric. It should be viewed with great suspicion if they are asymmetrically enlarged, and malignancy, particularly lymphoma, needs to be excluded. In the young patient, the tonsils may be hyperplastic and fill the oropharynx, but they tend to atrophy as the patient gets older. Crypts in the tonsils may be obvious and are occasionally filled with debris, which may be misinterpreted as an infectious membrane. This debris may, however, cause a persistent sore throat or result in hallitosis. Following tonsillectomy, there may be significant distortion of the oropharynx with loss of the anterior and posterior pillars and varying degrees of scarring. Residual tonsillar tissue, following inadequate tonsillectomy, may be present and can cause significant symptoms.

The posterior pharyngeal wall should then be evaluated. Although over postnasal drip may be seen, more commonly lymphoid hyperplasia secondary to the persistent postnasal drip may be obvious just in back of the posterior faucial pillars (lateral pharyngeal bands). A granular pharyngitis across the posterior wall may be present, and this is usually indicative of mouth breathing or irritation, for example, from cigarette smoking. As already stated, the base of the tongue is best visualized with a laryngeal mirror and, if possible, palpated. When palpating, a useful trick to prevent the patient, particularly a child, from biting the examining finger, is to

interpose the cheek and mucosa between the teeth with the other hand. This will discourage the child from biting.

Examination of the Larynx and Hypopharynx

The patient should be instructed to sit upright with a straight back and the head protruding slightly forward. With the mouth opened widely, the protruded tongue is grasped in a piece of folded gauze between the examiner's index finger and thumb. The middle finger is used to retract the patient's upper lip. A warmed or defogged laryngeal mirror is grasped like a pencil and inserted into the patient's oropharynx against the lower soft palate. The patient is instructed to concentrate on breathing in and out through the mouth. Although most patients tolerate the maneuver well, if there is a tendency to gag, topical local anesthesia is used. If the larynx cannot be adequately visualized because of the patient's inability to tolerate the procedure or because of an overhanging epiglottis, a fiberoptic laryngoscope passed through the nose can be used. This is well tolerated by almost all patients, particularly if topical anesthesia is used in the nose and pharynx. The larynx and hypopharynx are then systematically evaluated.

The base of the tongue down to the vallecula is examined first. The posterior and lateral walls of the pharynx should be assessed together with the upper aspects of the piriform sinuses, which are easily seen. Asymmetry or pooling of saliva in these areas is looked for. Next, the lingual surface and the laryngeal surface of the epiglottis is examined. Every effort should be made to ensure that the epiglottis down to the anterior commissure is visualized. Beware of the lesion that may lurk under the overhanging epiglottis. In order to bring the endolarynx into view, it is often necessary to ask the patient to phonate. The aryepiglottic folds and the false and true vocal cords should all be identified. Often the upper two or three tracheal rings can be seen.

Cord mobility now needs to be assessed. First, the resting position of the true vocal cords should be noted. During quiet breathing, the cord should abduct during inspiration. During phonation, the true cords should move to the median position. Ask the patient to say "eeee" or "hey". The latter sound often brings the larynx into better view without causing elevation of the posterior aspect of the tongue.

Examination of the Nasopharynx

This aspect of the head and neck examination is the most difficult to master. The patient should be instructed to open his or her mouth widely and breathe through it. This will result in elevation of the soft palate. The tongue should be firmly depressed making sure that the tip of the depressor is placed well anterior to the circumvallate papillae; otherwise, gagging will be provoked. With the patient relaxed, a warmed nasopharyngeal mirror should be grasped like a pencil and placed in the oropharynx behind the soft palate without touching the mucosa. If possible, the mirror should rest on the tongue depressor. The patient should then be instructed to breathe through the nose and mouth simultaneously, which drops the soft palate forward, allowing a good view of the nasopharynx. If the patient gags in spite of these precautions, a topical local anesthetic spray may be used. In the event that an adequate view is impossible, an

alternate method is to use the flexible fiberoptic nasopharyngoscope passed through the nose. The orientation is different, but with practice, a good view of the nasopharynx can be obtained.

As always, one should have a system for assessing an area, and the nasopharynx is no exception. First, the nasal septum should be visualized, then the posterior choanae, with the middle and inferior turbinates frequently visible. The eustachian tube orifices should then be inspected. The fossa of Rosenmüller lateral to the eustachian tube should also be evaluated. The dorsum of the soft palate, the posterior nasopharyngeal wall, and the vault of the nasopharynx should also be assessed before completing the examination.

Examination of the Nose

Before concentrating on the interior of the nose, the exterior should be carefully evaluated. Any obvious loss of structure or external deformity that may be a clue to structural abnormality within the nose should be looked for. The nose that does not look right usually does not function correctly. A saddle nose deformity caused by septal collapse may be apparent only on examination of the profile.

Before inserting a nasal speculum, the nasal vestibule should be carefully inspected for evidence of a caudal deflection of the nasal septum, which may be a cause of nasal obstruction. In children, a perfectly satisfactory view of the interior can be obtained by merely elevating the nasal tip with the thumb without using a nasal speculum.

The septum should be assessed first. In most individuals, some degree of septal deflection is present, usually without causing symptoms. The deviated septum may be deflected to one or both sides and is often associated with compensatory turbinate hypertrophy on the side of the concavity. Anterior rhinoscopy usually allows visualization of just the inferior turbinate and anterior aspect of the middle turbinate.

The mucosa should be examined and assessed as to whether it is atrophic, hypertrophic, or normal. Because of diffuse mucosal congestion, it is often extremely difficult to visualize the nasal interior adequately. In this situation, a topical vasoconstrictor can be applied to the mucosa either as a spray or on a pledget of cotton. The best substance for this task is 5 per cent cocaine, not only because it is an excellent vasoconstrictor but also because it acts as a local anesthetic, allowing probing and even a biopsy if necessary. Failure to respond to such vasoconstriction implies that the mucosa has undergone chronic hyperplastic change and will probably prove refractory to conservative therapy.

The amount and character of the nasal secretion should also be noted. This secretion is best seen on the floor of the nose, but the middle meatus should also be inspected for sinus drainage. Purulent rhinorrhea usually implies infection, but a yellowish tinge may also be present in allergic or vasomotor rhinitis. The presence of polyps or neoplasms should be looked for, avoiding the common mistake of misidentifying a turbinate as a polyp. Polyps are pale, mobile, and insensitive, whereas turbinates are nonmobile and extremely sensitive to probing.

Although many sophisticated tests are available for detecting nasal airflow, the easiest is simply to occlude first one then the other nostril and gauge the airflow through each one.

Evaluation of the Paranasal Sinuses

Although the paranasal sinuses are best evaluated radiographically, clinical evaluation can give valuable information in determining the presence and type of sinus disease. Probably the best indicator of sinus disease is the status of the nasal mucosa, which is obviously in continuity with the sinus mucosa and, therefore, will reflect any disease process involving the sinus, for example, infection or allergy. Careful examination of the middle meatus may reveal exudate discharging from the sinus ostia, thereby suggesting the type of secretion in the sinus. Transillumination of the maxillary and frontal sinuses, although extremely popular in the past, has only limited value in evaluating the sinuses. Palpation of the sinuses, particularly the frontal and maxillary ones, can be useful, with severe tenderness being suggestive of an empyema of the sinus.

A full evaluation of the cranial nerves is essential in performing an adequate head and neck examination. Although not necessary in every situation, certain discipline is required to include this in the routine examination, and every effort should be made to do so.

Likewise, at least a rudimentary examination of the *eyes,* including ocular movement and visual acuity, is necessary. The temporomandibular joint also should be palpated with the mouth both open and closed, and the bite should be carefully assessed.

Evaluation of the ear is discussed elsewhere but is obviously necessary in all patients.

Finally, having completed the examination, the findings are immediately recorded in a systematic and legible form. Basic diagrams are useful. In the litigious society in which we live, this is essential. Obviously, the photograph supplies the ideal form of documentation and if facilities are available, photographic documentation should be obtained when feasible.