CHAPTER 4

HEAD AND NECK

Problems of the head and neck in the practice of plastic surgery include congenital, traumatic, infectious, neoplastic, and other conditions.

I. CONGENITAL

A. Cleft Lip and Cleft Palate

1. Anatomy (Fig. 4-1)
   a. Clefts of the lip occur in the primary palate (anterior to the incisive foramen) and may also involve the alveolar process
   b. Clefts of the palate occur in the secondary palate, the roof of the mouth posterior to the incisive foramen and may involve both hard and soft palate

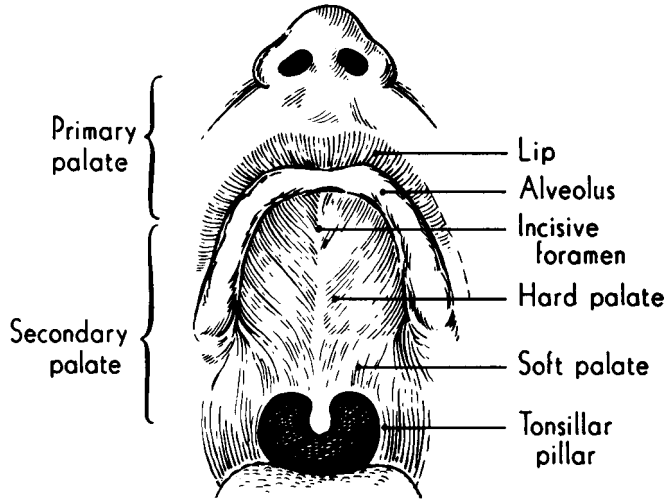


Fig. 4-1

2. Classification
   a. Lip (Fig. 4-2)
      i. Unilateral
         (a) Complete
         (b) Incomplete
      ii. Bilateral
         (a) Complete
         (a) Incomplete
      iii. Median
         (a) Complete
         (a) Incomplete
   b. Palate (Fig. 4-3)
3. Prevalence
   a. Cleft of lip with or without cleft palate (CL±CP) 1:700 in Caucasians, less in African-Americans, greater in Asians
   b. Cleft of palate alone (CP) 1:2500
4. Occurrence risk in offspring (Table 4-1)
5. Etiology
   a. Multifactorial combination of heredity with or without environmental factors
   b. Teratogenic agents — e.g. pheyntoin, alcohol
   c. Nutritional factors may contribute — folate deficiency

Affected Relatives	**Predicted Outcomes***
CL±CP	
One sibling	≈ 4%
One Parent	≈ 4%
Sibling and a Parent	≈ 16%
CP	
One Sibling	≈ 2-4%
One Parent	≈ 2-4 %
Sibling and a Parent	≈ 15%

***Note —** If congenital lip pits, inherited as autosomal dominant gene with variable penetrance (Van der Woude's Syndrome) — 50% incidence*

**General predictions; individual cases may vary*

Table 4-1

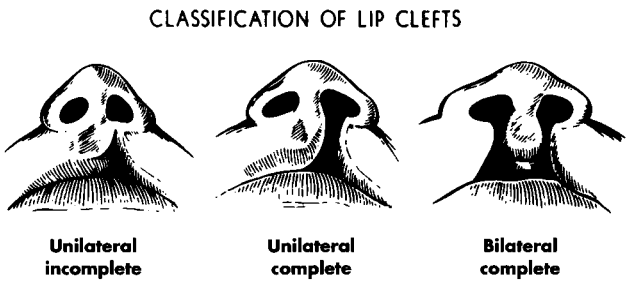


Fig. 4-2

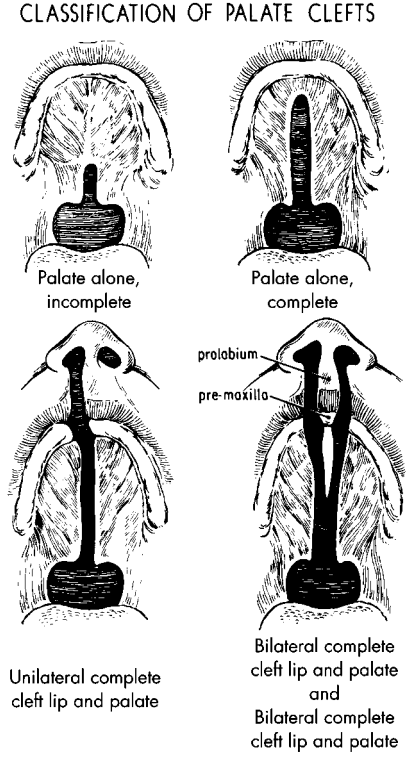


Fig. 4-3

6. Embryology
   a. Cleft lip with palate forms at 4-6 weeks due to lack of mesenchymal penetration (merging) and fusion
   b. Isolated cleft palate forms later, at 7-12 weeks, from lack of fusion
7. Pathophysiology
   a. Cleft lip
      i. Inability to form fluid and air seal in eating or speech
      ii. Malocclusion as a result of failure of lip seal and intrinsic deformities of alveolar process and teeth
      iii. Lack of continuity of skin, muscle and mucous membrane of lip with associated nasal deformity and nasal obstruction
      iv. Deformity
   b. Cleft palate
      i. Inability to separate nasal from oral cavity so that air and sound escape through nose in attempted speech
      ii. Feeding impaired by loss of sucking due to inability to create intra-oral negative pressure
      iii. Loss of liquids and soft foods through nose due to common nasal-oral chamber
      iv. Middle ear disease in 100% of patients due to Eustachian tube dysfunction, abnormal mucus
      v. If Pierre-Robin sequence (cleft palate, micrognathia, glossoptosis), airway obstruction and failure to thrive requires various positioning in intensive care setting, possible surgery to position tongue forward or rarely, tracheostomy
8. Team concept
   Because of multiple problems with speech, dentition, hearing, etc., management of the patient with a cleft should be by an interdisciplinary team, preferably in a cleft palate or craniofacial center

9. Timing of Primary Repair
    a. Cleft lip — most common 10 weeks of age (range 1 wk to 6 mos)
    b. Cleft palate — before purposeful sounds made (9-12 mos), depending upon health of infant, extent of cleft, but certainly before 18 months of age, if possible
10. Principles of Primary Repair
    a. Cleft lip
        i. Repair of skin, muscle and mucous membrane to restore complete continuity of lip, symmetrical length and function
        ii. Simultaneous repair of both sides of a bilateral cleft lip
        iii. Preference for primary nasal reconstruction at time of lip repair
    b. Cleft palate
        i. One stage repair of both hard and soft palate
11. Secondary Repair
    a. Cleft lip
        i. Revision of lip repair if needed
        ii. Revision of nose as required
        iii. Repair of alveolar cleft (if present) with bone graft around 9 years of age (time of eruption of canine teeth)
    b. Cleft palate
        i. Correction of velopharyngeal inadequacy (nasal escape of sound and air due to remaining structural defect of palate)
        ii. Repair of any palate fistula

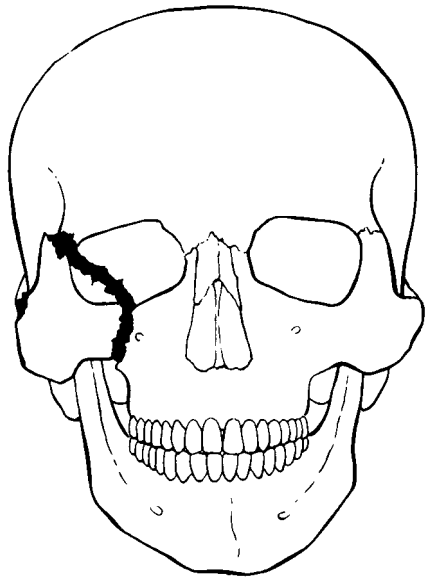
B. Other Congenital Anomalies
1. The most common anomalies are:
    a. Branchial cyst, sinus, or fistula
        i. An epithelial-lined tract frequently in the lateral neck presenting along the anterior border of the sternocleidomastoid muscle. May present as a cyst or as a sinus connected with either the skin or oropharynx, or as a fistula between both skin and oropharynx openings
        ii. Treatment — excision

    b. Thyroglossal duct cyst or sinus
        i. Cyst in the mid-anterior neck over or just below the hyoid bone, with or without a sinus tract to the base of the tongue
        ii. Treatment — excision
    c. Ear deformities
        i. Types
            (a) Complete absence (anotia) — very rare
            (b) Vestigial remnants or absence of part of ear (microtia)
            (c) Absence of part or all of external ear with mandibular deformity (hemifacial microsomia)
            (d) Abnormalities of position (prominent ears)
        ii. Treatment
            (a) Anotia or microtia-construction from autogenous cartilage graft or synthetic implant, vascularized fascial flap, skin graft — usually requires more than one operation. (Traumatic loss of part or all of ear is treated similarly). Use of a prosthetic ear may be indicated in some patients
            (b) Prominent ears — creation of an anthelical fold and/or re-positioning/ reduction of concha
2. Less common anomalies
    a. First and second branchial arch syndrome
    b. Treacher-Collins Syndrome: mandibulofacial dysostosis
    c. Crouzon's and Apert's syndrome: craniosynostosis with skull and facial deformities including midface retrusion
    d. Many others — see reference in bibliography
        i. Treatment — most patients can be significantly improved by surgical operations (craniofacial surgery)

II. TRAUMATIC

A. Facial soft tissue injuries
   1. Evaluation of all systems by trauma team
   2. Establishment of airway (may be obstructed by blood clots or damaged parts) by:
      a. Finger
      b. Suction
      c. Endotracheal intubation
      d. Cricothyroidotomy or tracheotomy
   3. Control of active bleeding by pressure until control by hemostats and ligatures or cautery in operating room
   4. Treatment of shock
   5. Very conservative debridement of detached or nonviable tissue
   6. Careful wound irrigation with physiologic solution
   7. Remove all foreign materials
   8. Palpate or explore all wounds for underlying bone injury; rule out injury to facial nerve, parotid duct, etc.
   9. Radiologic evaluation
   10. Repair as soon as patient's general condition allows with meticulous reapproximation of anatomy
      a. Preferably less than 8 hours post-injury
      b. Primary closure may be delayed up to 24 hours (dressing should be applied and antibiotics given while waiting)
   11. Tetanus prophylaxis
   12. Antibiotics if indicated

B. Facial bone fractures
   1. Classification
      a. Mandible only — often bilateral
      b. Zygomatic complex (Fig. 4-4)
      c. Maxillary — Le Fort I, II, III (Fig. 4-5)
      d. Naso-orbital-ethmoidal (NOE)
      e. Frontal sinus
      f. Other isolated fractures — e.g. nasal
      g. Combination of above
      h. Closed or open



FRACTURE OF ZYGOMATIC COMPLEX

Fig. 4-4

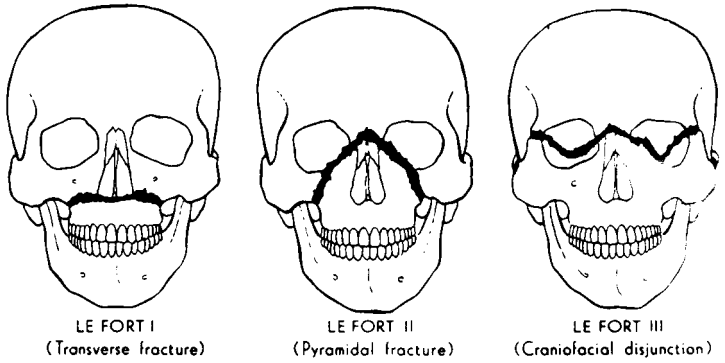


Fig. 4-5

2. Diagnoses
   a. Consider patient history
   b. Physical examination for asymmetry, bone mobility, diplopia, extraocular muscle entrapment, sensory loss, malocclusion, local pain
   c. X-rays
      i. Skull and cervical spine
      ii. CT scan — axial and coronal
      iii. Specialized views
         (a) Waters view for facial bones (Fig. 4-6)
         (b) Mandibular views and Panorex if mandibular fracture present since CT scan does not visualize mandible fractures well
3. Treatment
   a. Consultant (dentist or ophthalmologist) when indicated
   b. Re-establishment of normal occlusion is of primary importance

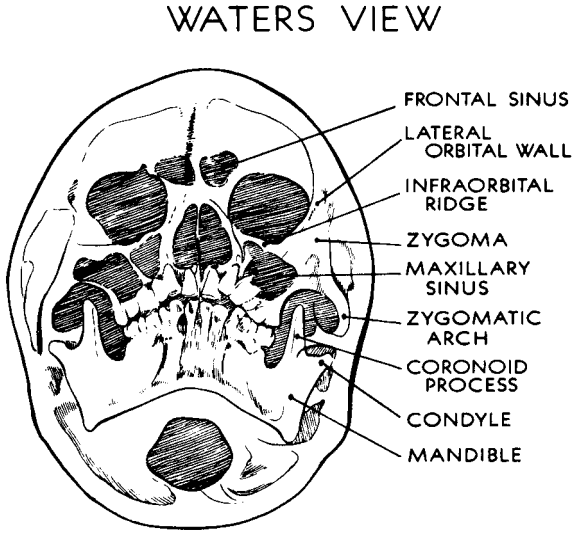


Fig. 4-6

      i. Use of interdental wiring, plating, or other devices in patient with teeth
      ii. Use of patient's dentures or fabricated temporary dentures in edentulous patient
   c. Reduction and immobilization of other fractures
      i. Maintain by plating with or without wiring
      ii. In orbital floor or wall fractures, reconstitute floor and walls to prevent enophthalmos

III. INFECTIONS

A. The head and neck are relatively resistant to infection due to their robust vascularity
B. Routes of spread
   1. Upper aerodigestive infections may track into the mediastinum
   2. Scalp and orbital infections may spread intracranially via the dural sinuses and ophthalmic veins
C. Facial cellulitis — mostly due to staph or strep — may use a cephalosporin
D. Oral cavity infections — mostly due to anaerobic strep and bacteroides. Use extended spectrum penicillin or other anaerobic coverage
E. Acute Sialadenitis — fever, pain, swelling over the involved parotid gland. Seen with dehydration, debilitation, diabetics, poor oral hygiene. Treat with antibiotics, fluids
F. Atypical mycobacteria — seen in enlarged lymph nodes; drainage rarely required. Special cultures may be necessary

IV. NEOPLASTIC *(exclusive of skin — see Chapter 3)*

A. Salivary gland tumors or disorders
   1. Classification of tumors by location
      a. Parotid — most common (80%), most are benign (80%)
      b. Submandibular — 55% incidence of malignancy
      c. Minor salivary glands — least common, with highest incidence of malignancy (about 75%)
   2. Diagnosis
      a. Primarily by physical examination
         i. Any mass in the pre-auricular region or at the angle of the jaw is a parotid tumor until proven otherwise

b. Bimanual palpation — simultaneous intraoral and external palpation
c. X-rays occasionally helpful for diagnosis of stone; sialography (injection of contrast material into duct) is rarely if ever indicated
d. Signs more commonly seen with malignancy
i. Fixed or hard mass
ii. Pain
iii. Loss or disturbance of facial nerve function
iv. Cervical lymph node metastases

3. Treatment
a. For stone near duct orifice
i. Simple removal
b. For benign tumors (or stones in duct adjacent to gland)
i. Surgical removal of gland with sparing of adjacent nerves, e.g. facial nerve with parotid; lingual and hypoglossal nerves with submandibular
c. For malignant tumors
i. Surgical removal of entire gland with sparing of nerve branches that are clearly not involved
(a) Radiation therapy if tumor not completely removed
(b) Cervical lymph node dissection with tumors prone to metastasize to nodes

4. Pathology
a. Benign
i. Pleomorphic adenoma — (benign mixed) high recurrence rate with local excision
ii. Papillary cystadenoma lymphomatosum (Warthin's tumor) — may be bilateral — (10%) male, age 40-70
b. Malignant
i. Mucoepidermoid
ii. Malignant mixed
iii. Adenocarcinoma

B. Tumors of oral cavity
1. Classification
a. Anatomical — malignancies behave differently according to anatomic site and prognosis worsens from anterior to posterior
i. Lip
ii. Anterior two-thirds tongue
iii. Floor of mouth
iv. Buccal
v. Alveolar ridge
vi. Posterior tongue
vii. Tonsillar fossa and posterior pharynx
viii. Hypopharynx
b. Histopathologic
i. Benign — according to site — fibroma, osteoma, lipoma, cyst, etc.
ii. Malignant
(a) Most are squamous cell carcinoma or variants
(b) Palate carcinomas are often of minor salivary gland origin
(c) Sarcomas in mandible, tongue, other sites are rare
(d) TNM staging is helpful for treatment planning and prognosis (i.e. tumor size, lymph node metastases, systemic metastases)

2. Diagnosis
a. Examination — including indirect laryngoscopy and nasopharyneal endoscopy when indicated
b. Biopsy of any lesion unhealed in 2-4 weeks
c. X-rays and scans as indicated
i. Conventional views, panorex, etc.
ii. Tomography
iii. Computerized axial tomography
iv. Bone scan
v. Magnetic resonance imaging

3. Treatment
a. Surgical
i. Benign
(a) Simple excision

ii. Malignant
(a) Wide local excision with tumor-free margins
(b) Regional lymph node dissection when indicated
(c) Palliative resection may be indicated for comfort and hygiene
(d) Immediate reconstruction with vascularized flaps when indicated by size and location of defect

b. Radiation therapy
i. Preoperative
(a) To increase chance for cure, especially with large lesions
(b) May make an inoperable lesion operable
ii. Postoperative
(a) If tumor-free margin is questionable
(b) For recurrence
(c) Prophylactic — controversial

c. Chemotherapy — usually for advanced disease

V. MISCELLANEOUS

A. Disorders of the jaw
1. Deformities of the mandible
a. Classification
i. Retrognathia — retrusion with respect to maxilla
ii. Prognathia — protrusion with respect to maxilla
iii. Micrognathia — underdeveloped, retruded mandible
iv. Open bite — teeth cannot be brought into opposition
v. Crossbite — lower teeth lateral to upper teeth
vi. Micro — and macrogenia — under- or over-development of chin

b. Diagnosis
i. Physical examination
ii. X-rays, including a cephalogram (lateral x-ray at a fixed distance) to measure relationships of skull, maxilla and mandible

c. Treatment
i. Establishment of normal or near normal occlusion of primary importance
ii. Use of osteostomies with repositioning of bone segments, bone grafts as needed, with or without orthodontic corrective measures as needed

2. Deformities of the maxilla
a. Most commonly, retrusions or under-development, "dish-face"
b. Diagnosis — as for lower jaw
c. Treatment — as for lower jaw

3. Temporomandibular joint disorder
a. Etiology
i. Previous trauma
ii. Arthritis
iii. Bone overgrowth
iv. Bruxism
v. Tumors

b. Symptoms:
i. Pain
ii. Erepitus
iii. Joint Noises
iv. Limited opening
v. Occlusion change

c. Diagnosis
i. Consider patient history
ii. Examination
(a) Auscultation
(b) Opening
(c) Occlusion
iii. X-rays
(a) Tomograms
(b) Arthrogram/arthroscopy
(c) MRI

d. Treatment
    i. Conservative: joint rest, analgesias, bite plate, etc.
    ii. Surgery — seldom indicated

B. Facial paralysis

Loss of facial nerve results in very significant asymmetry and deformity of the face, drooling, exposure of the cornea on the affected side. Deformity is accentuated by muscle activity of normal side (if unilateral)

1. Etiology
    a. Idiopathic (Bell's palsy)
    b. Congenital
    c. Traumatic
    d. Infectious
    e. Tumor
    f. Vascular (intracranial)
2. Diagnosis
    a. Demonstrated by asking patient to raise eyebrow, smile, etc.
3. Treatment includes:
    a. Supportive — for most Bell's palsies
    b. Protect cornea by taping lids, lid adhesions
    c. Re-establishment of nerve function by repair or nerve graft
    d. Other measures, such as muscle transfers, static suspension, skin resections, free tissue transfers of muscle, etc.

CHAPTER 4 — BIBLIOGRAPHY

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