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Mandibulofacial Dysostosis

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Mandibulofacial dysostosis (Treacher Collins syndrome, Franceschetti-Zwahlen-Klein syndrome) is a rare autosomal dominant craniofacial malformation. Nevertheless, it often occurs as a sporadic mutation in a family previously unaffected. The phenotypic expression of the syndrome affects primarily the first and second branchial arches bilaterally and causes several facial disfigurements. The syndrome is caused by a fetal vascular anomaly that deprives the first branchial arch of its blood supply, which originates mainly from the stapedial artery between the third and fifth weeks of gestation. Poswillo produced a phenotypic copy of this syndrome in mice using teratogenic doses of vitamin A.

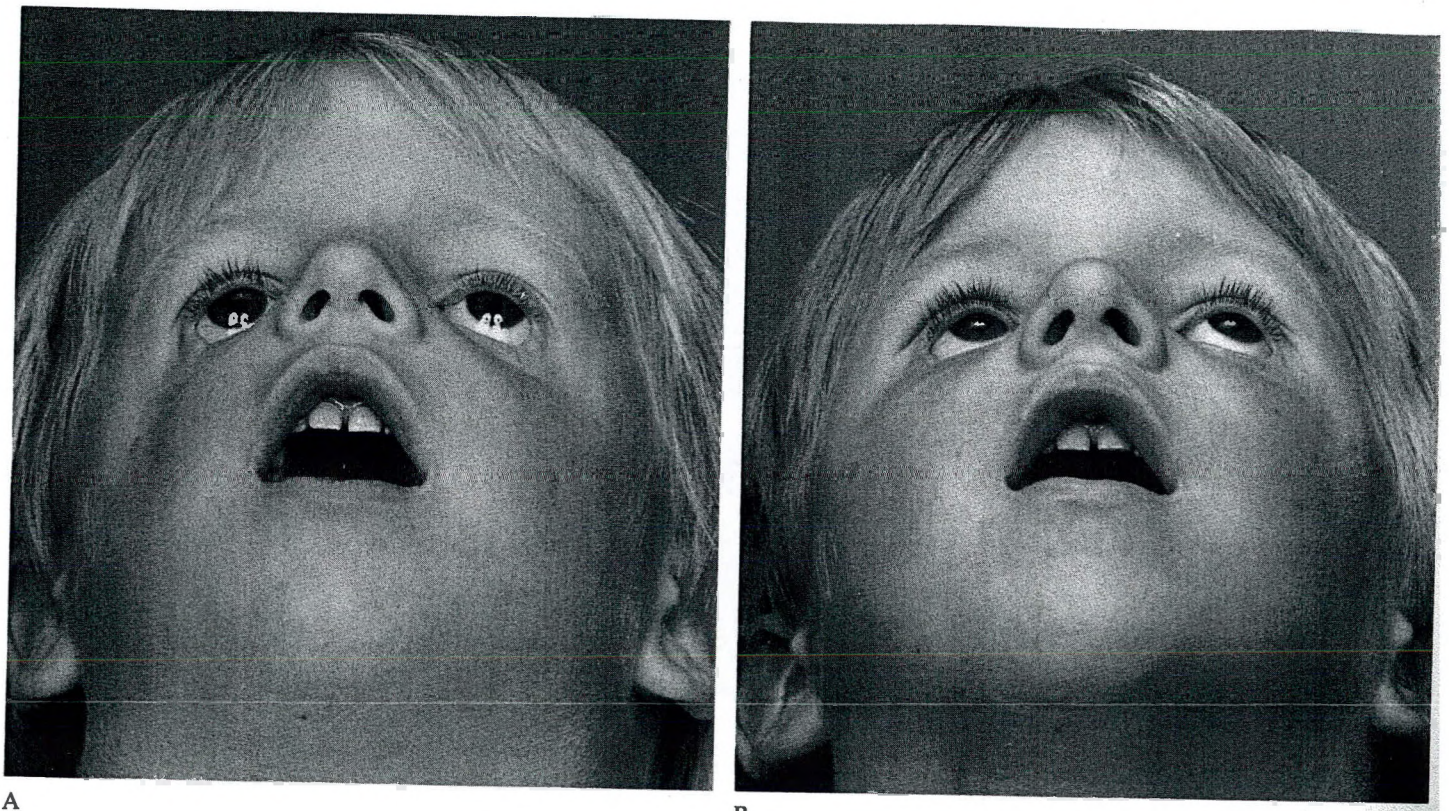
Since the early descriptions of the syndrome by Thompson in 1846, Barry in 1889, and Treacher Collins in 1900, many reports have described its facial characteristics—an antimongoloid obliquity of the palpebral fissure, notched lower eyelids, coloboma, ovoid orbital apertures, microphthalmia, hypoplasia of the malar and mandibular bones, a large mouth with irregular teeth and malocclusion, and a deformed external and sometimes middle and inner ear. Associated with these characteristics may be deafness, preauricular sinuses, dwarfism, cardiac and skeletal defects, and abnormalities of the upper airway. Obstructive sleep apnea in Treacher Collins syndrome also has been related to mandibular hypoplasia.

Treatment of this disease is regional reconstructive surgery. In 1982 a radical procedure was developed by Tessier and Tulasne. In its severe expression, this syndrome still represents one of the most challenging reconstructive problems for the craniomaxillofacial surgeon.

Principles of Treatment

The philosophy of treatment of craniofacial deformities and malformations depends on the length of experience of the particular surgeon and the analysis of the achieved results. The Department of Maxillofacial Surgery of the University Hospital in Zurich, Switzerland, has a tradition of almost 40 years of treatment of facial deformities. The Treacher Collins syndrome was one of the first malformations in which the sagittal splitting method and the sliding chin advancement technique were performed in a highly effective and elegant way. Over the years and with the development of craniofacial surgery, the following treatment principles were established in Zurich. Some of them are relevant to the treatment of the Treacher Collins syndrome.

1. Visible scars are considered a defeat in maxillofacial plastic surgery. The incisions routinely used nowadays are the bicoronal and the buccal sulcus incisions. Supraorbital, infraorbital, and submandibular skin incisions have been abandoned. The transconjunctival approach is still accepted and used for exposure and microplating of the infraorbital rim.
2. Autologous bone and cartilage grafts are not used because the donor site morbidity includes pain, infection, and other complications; because these grafts leave visible scars on the thorax, iliac crest, and elsewhere; because hospitalization may be prolonged; and because free autologous onlay bone grafts undergo some degree of absorption regardless of the origin of the graft, whether it be the iliac crest, the ribs, or the calvarium.



A B

Fig. 38-1. Five-year-old patient with Treacher Collins syndrome before (A) and after (B) zygomatico-orbital reconstruction with lyocartilage demonstrating a natural contour of the area involved.

3. Homologous lyophilized and sterilized bone and cartilage grafts are used exclusively for surgical reconstruction in all kinds of craniomaxillofacial malformations. These grafts are processed in the tissue bank of the Department of Maxillofacial Surgery at the University of Zurich. The infection rate after the use of lyocartilage is lower than that after an autologous graft. The unique property of lyocartilage processed by our method is its slow transformation into the patient's own bone without resorption. Lyobone is less rapidly resorbed and incorporated than autologous bone and therefore offers more stability. Lyobone is taken from the iliac crest, the calvarium, the femur, the sternum, or the ribs. It is chosen by the surgeon according to the needs of construction or reconstruction. It goes without saying that these materials are not only lyophilized but also sterilized and taken from specially selected donors of a young age group.
4. Craniofacial segments cut with the osteotome are stabilized by miniplates and microplates and by lag or compression screws. Therefore, an intermaxillary fixation can often, but for safety reasons cannot always, be avoided.

Timing of Surgical Treatment

For each craniomaxillofacial malformation there is a special timing protocol for surgical intervention. The timing for mandibulofacial dysostosis is as follows.

Patients with an Isolated Cleft Palate

Palatal closure follows the timing of the Zurich cleft palate treatment at the age of 15 to 18 months. The method used for closure is that of Perko derived from the Widmaier technique. Our convincing speech results after the techniques of palatoplasty were published by van Denmark and associates. Primary orthodontic treatment is not used for patients with isolated cleft palates. An audiologist, who is a member of our treatment team, examines and treats the child according to a speech therapy protocol that is the same as for a child with a cleft palate.

Patients Without a Cleft Palate

Treatment is provided at the age of 2 to 4 years, before the child goes to kindergarten. Construction of the zygomatic arch and bone, the infraorbital and lateral orbital rim and walls, and the lateral parts of the forehead is undertaken at this age using lyocartilage exclusively. At the same time the prolapse of the lateral supraorbital rim is trimmed off using a bur to modify the ovoid form of the orbital aperture. Audiologic examinations with objective audiometry are performed during the first months of life, and hearing aids if necessary are given as soon as possible.

If an elongated coronoid process inhibits the mouth from opening, the process is

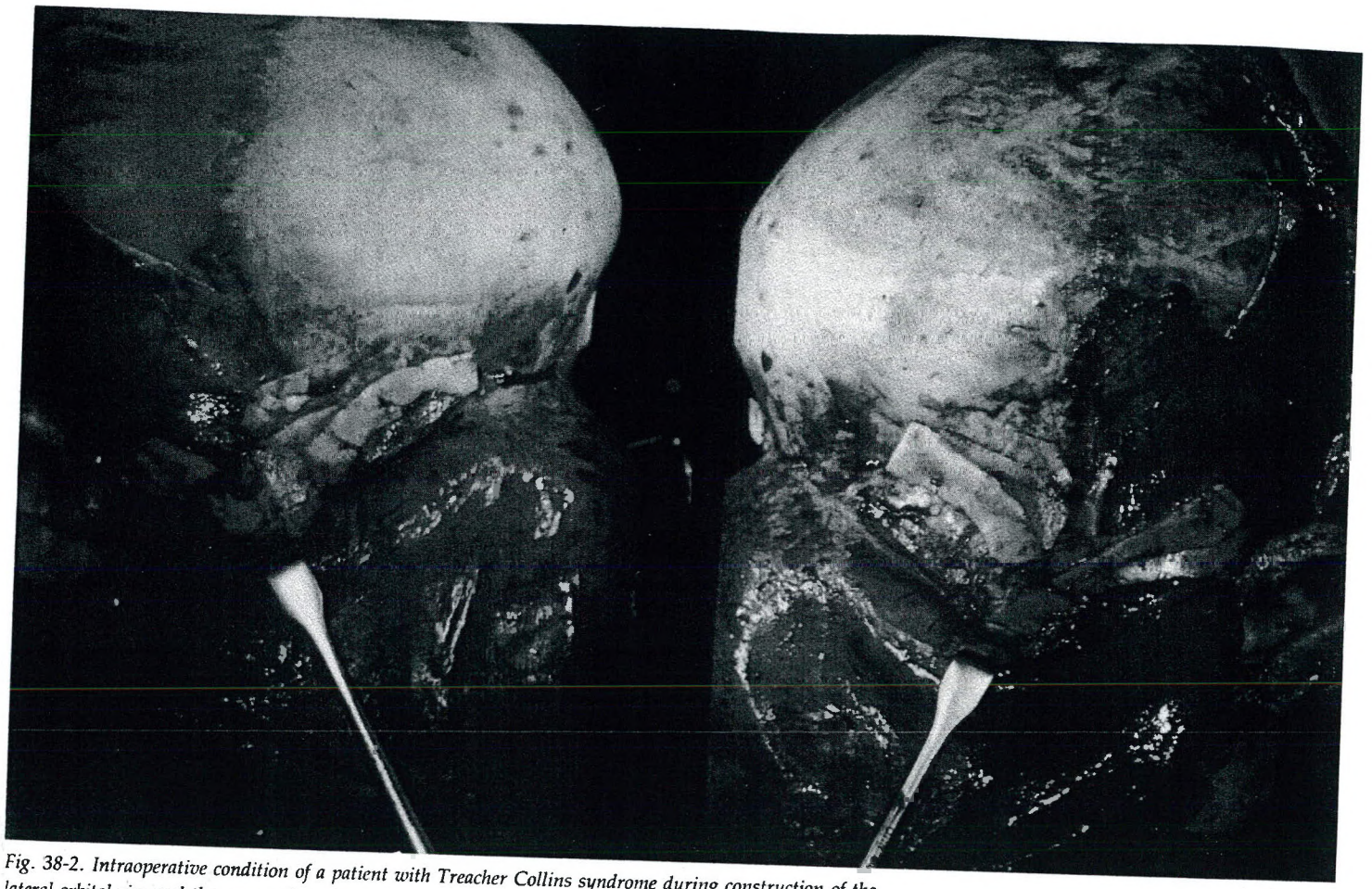


Fig. 38-2. Intraoperative condition of a patient with Treacher Collins syndrome during construction of the lateral orbital rim and the zygomatic arches using slices of lyocartilage.

removed. During the same operation, any ankylosis between the coronoid process and the rudimentary zygomatic arch is removed. Simultaneously the lower eyelid is placed into a normal position by elevation using lyophilized cartilage for infraorbital rim support and lateral canthopexy.

The receded chin prominence is built up with lyocartilage. A simultaneous sliding chin osteotomy is not indicated at this age to avoid damage to the caudally positioned buds of the permanent teeth, located in the chin area. Depilation of the dystopic hairline running in the direction of the angle of the mouth should also be performed at this stage.

Children 6 to 10 Years of Age

Depending on the growth deficiency, the zygomatic and periorbital areas can be repeatedly built up with lyocartilage to achieve good proportion and harmony during growth of the middle third of the face. The indications for these procedures depend on the individual psychological and social needs of the child and the severity of the malformation. Between the ages of 6 and 10 years, orthodontic activator treatment is indicated to develop the hypoplastic mandibular ramus.

Children 12 Years or Older

From the age of 12 years on, orthodontic presurgical treatment takes place 14 months for girls and 16 months for boys before the surgical advancement of the mandible and the chin or a combination of operations on the upper and lower jaw is performed. The mandibular operation may be performed before general growth has ceased because of the obvious lack of further condylar growth in most children. Postsurgical orthodontic follow-up care is necessary until facial growth is complete.

Surgical Procedure

Zygomatic-Orbital Defects

We use a bicoronal incision for exposure. Under direct observation the pathologic anatomy is evaluated. The periosteum is carefully elevated along the rudimentary orbital walls and especially in the infraorbital region. Here multiple periosteal cuts are made vertically in the direction of the upward pull of the lateral canthus. Wherever periosteum is identifiable in the zygomatic area, it is incised in a rectangular pattern to allow maximal expansion of the soft tissues.

Lyophilized rib cartilage is cut into 0.6- to 1.0-mm slices with the help of a dermatome. The zygomatic arch and infraorbital rim are constructed using several layers of lyocartilage, fixed with 0.3-mm wires or absorbable suture material. Finally, the orbital floor and lateral orbital wall are built up and the flattened supraorbital forehead area is recontoured. At this point the prolapse of the lateral supraorbital rim is trimmed off using a bur to modify the ovoid form of the orbital aperture (Figs. 38-1 and 38-2).



Fig. 38-3. Intraoperative situation in a young patient with Treacher Collins syndrome. The canthopexy wire (w) is led through two bur holes within the supraorbital rim (SOR). PO = periorbit; P = pericranium; LC = lyocartilage.

Elevation of Lower Eyelid and Lateral Canthus

The most effective point for upward pulling of the eyelids is identified, and a woven fine wire or a nylon suture is thread through for fixation of the canthus to the orbital rim, if present, or to the sheets of lyocartilage used for construction of the lateral orbital rim. The eyelids and the canthus are always elevated together; this elevation is not stable without simultaneous lower eyelid support by the lyocartilage grafts (Fig. 38-3).

Augmentation of Chin with Lyocartilage and Construction of a Labiomental Groove

The incision is made in the anterior mandibular vestibule, the periosteum is elevated, and two bur holes are made through the most caudal rim of the chin, where no tooth buds are present. For determination of the most favorable location of the bur hole, a cephalometric roentgenogram and orthopantomogram are used. A lyocartilage block is cut and fixed to the bone surface with wires or suture material (Fig. 38-4).

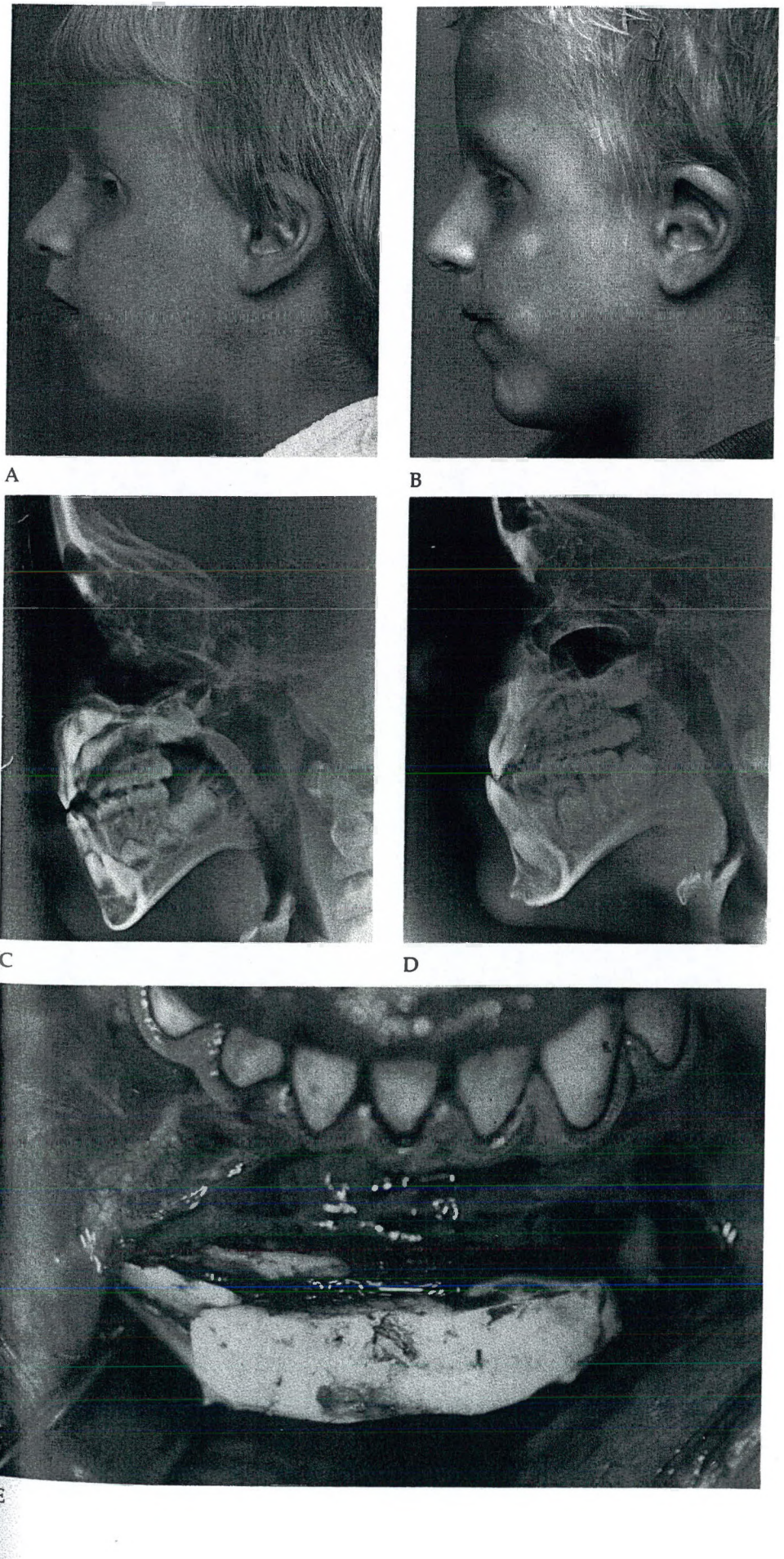


Fig. 38-4. Chin augmentation using lyocartilage. The preoperative view (A) and the condition 6 years postoperatively (B). The preoperative cephalometric roentgenogram (C) shows the caudal position of the tooth buds in the chin region at the age of 5 years. The condition 6 years later (D) shows the ossified lyocartilage seen in the intraoperative photograph (E).

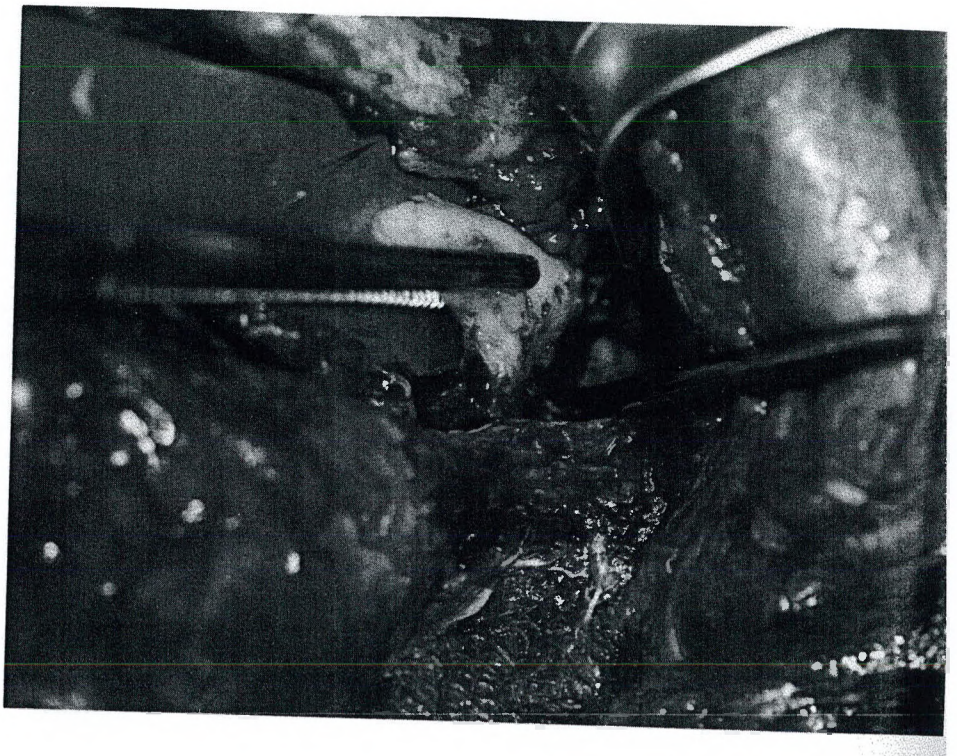


Fig. 38-5. Intraoperative view during removal of the elongated coronoid process.

Removal of Elongated Coronoid Process When Mouth Opening Is Inhibited

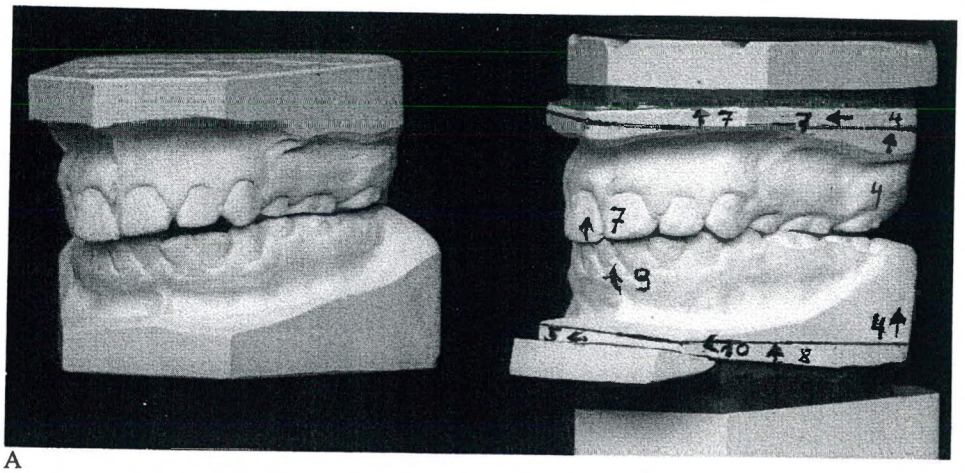
Immediately before construction of the zygomatic arch, the coronoid process is palpated within the temporal muscle. The muscle fibers are divided by blunt dissection, and the process is sectioned and removed (Fig. 38-5).

Positioning of Lower and Upper Jaw Depending on the Severity of the Deformity

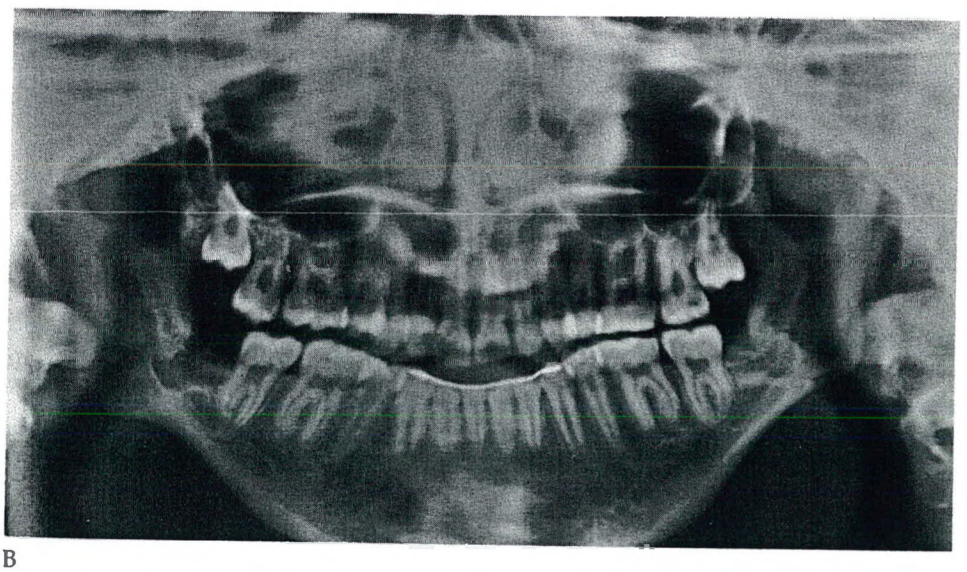
As soon as orthodontic treatment allows surgical intervention, a cast model operation is performed. This procedure simulates the advancement of the mandible in small deformities or the three-dimensional movement of the whole maxillomandibular complex in more severe deformities (Fig. 38-6A). We have found that it is extremely important to normalize the relation between the length of the upper lip and the position of the maxillary incisors. In severe deformities, the maxilla often has to be raised in the anterior area and tilted downward in the posterior aspect. Simultaneously the mandible is advanced massively. The heavy backward pull of the genioglossus and geniohyoid muscles is eliminated by resection of the posterior mental spine and by interpositioning lyobone into this point (Fig. 38-6G). To ensure the patency of the nasal airways, the inferior turbinate bones must be reduced in instances in which the maxilla has to be raised.

For elongation of the ramus and body of the mandible, long sagittal splitting is used as described by Obwegeser; for maxillary movements, a Le Fort I osteotomy is performed. A Le Fort II osteotomy as advocated by Tessier is rarely indicated and then only in extreme instances of mandibulofacial dysostosis.

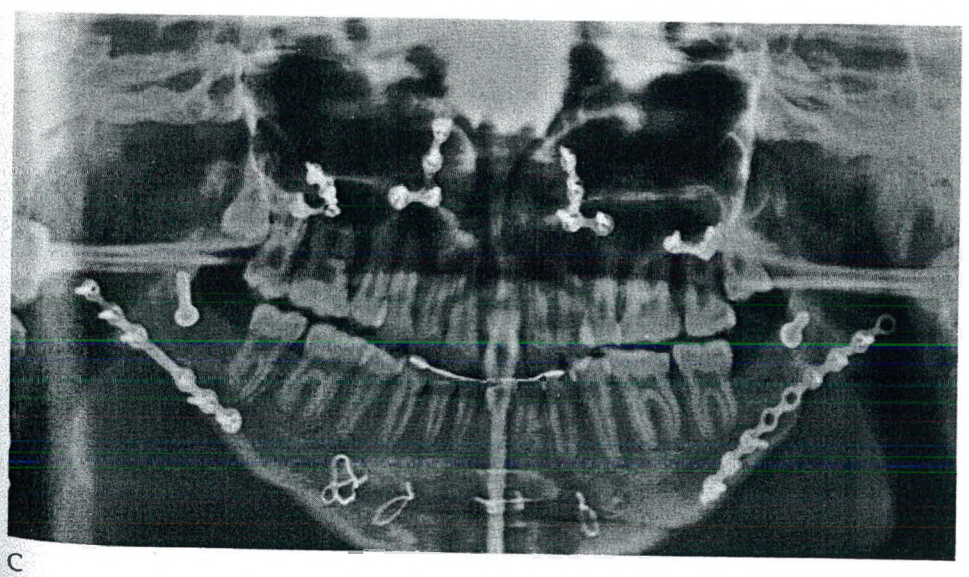
Fig. 38-6. Patient with Treacher Collins syndrome who underwent a bimaxillary operation for facial harmony. The cast model operation (A) gives the exact movements of upper and lower jaw. The preoperative (B) and postoperative (C) orthopantomograms detail our technique of segmental fixation using miniplates at the Le Fort I osteotomy level and in the area of the mandibular sagittal splitting (together with positioning screws). The lower wisdom teeth are removed 4–6 months before the operation. The preoperative cephalometric roentgenogram (D) shows the lip incompetence caused by the open bite and the unfavorable relation between the upper lip and the incisors. The postoperative cephalometric roentgenogram (E) reveals the harmony of the facial thirds. ▶



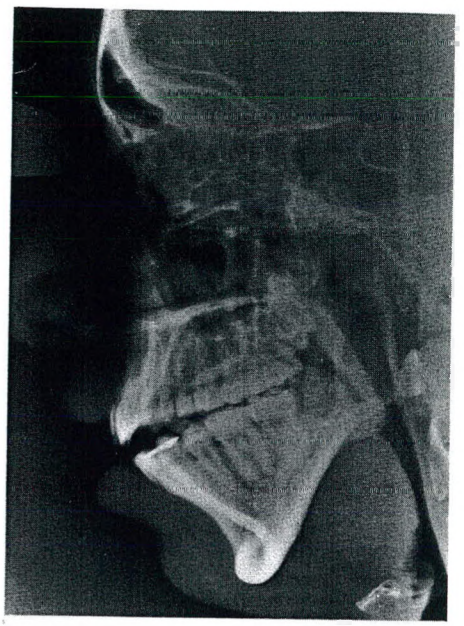
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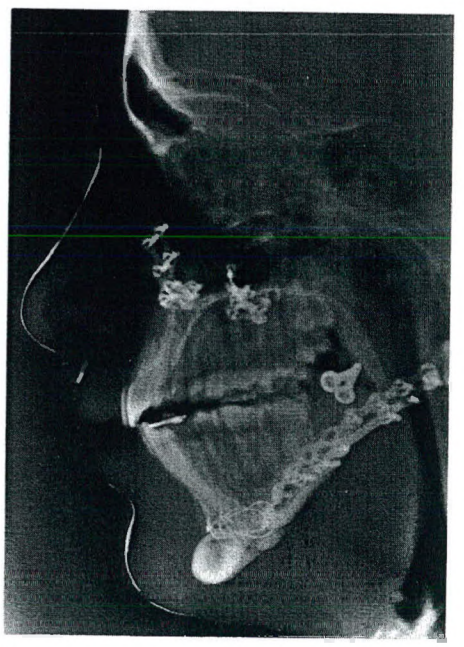
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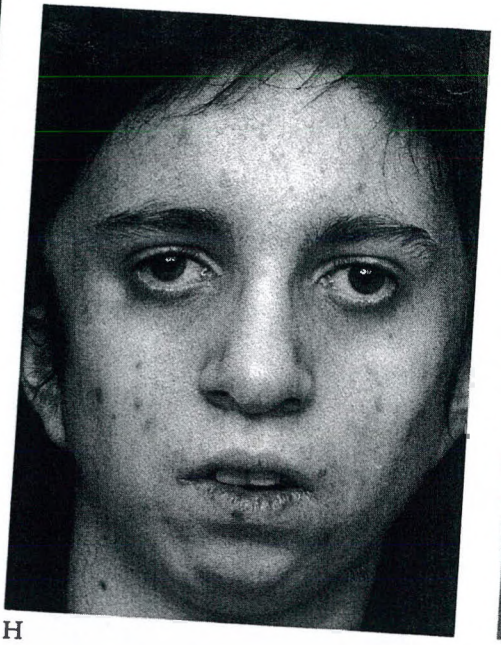
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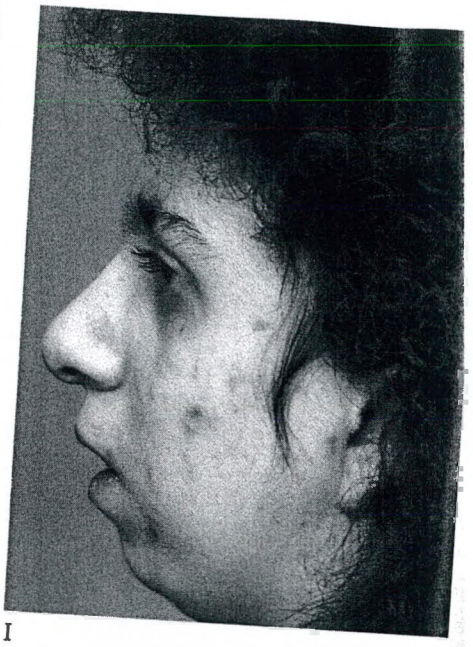
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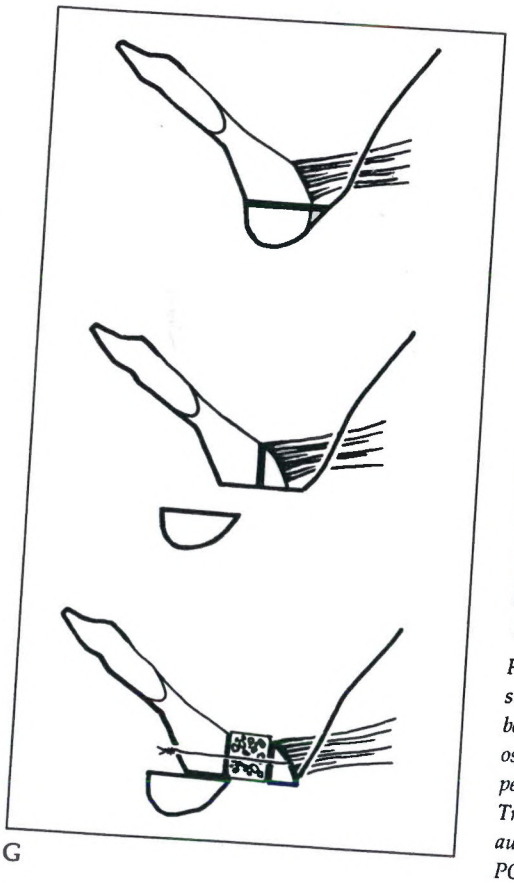
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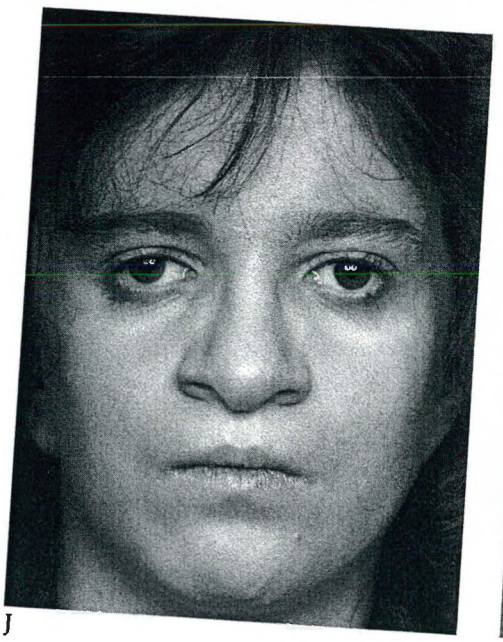
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Fig. 38-6. (Continued) The movements of the bones and the soft tissues are demonstrated in the superpositional drawings of the cephalograms (F). To avoid a relapse caused by the pull of the muscle, the bony origin of the genioglossal and geniohyoid muscles is sectioned by the transoral approach (G) after an osteotomy of the chin prominence, sagittal splitting of the rami, and an interpositional lyobone graft are performed. Wiring is used for fixation. This procedure allows restoration of normal facial appearance in Treacher Collins syndrome, as shown in the preoperative (H, I) and postoperative (J, K) photographs. Further augmentation of the zygoma and a nasal correction were declined by the patient. PR = preoperative; PO = postoperative; solid line = preoperative; dotted line = postoperative.

Reconstruction of Auricular Deformities

Reconstruction of the various auricular deformities depends on the amount of tissue present. If very few or no auricular remnants exist, we recommend the use of artificial auricles fixed to osseointegrated titanium implants. Auricular reconstruction, if needed, is postponed until adolescence.

Correction of Coloboma

Correction of coloboma should not be performed before construction of the zygoma, which tremendously improves the eyelid position and the oblique axis of the palpebral fissure. In extreme instances of ectropion, the usual Z-plasty corrections are not sufficient and full-thickness skin or composite grafts taken from the rudimentary auricles are necessary for the reconstruction of the lower eyelid.

Nasal Reconstruction

Nasal reconstruction is not always required; it depends on the individual needs of the patient.

Anesthesiologic Considerations

Patients with mandibulofacial dysostosis present special anesthesiologic problems. Only a skilled anesthetist who has mastered blind and fiberoptic intubation should work with these patients. The discrepancy between the size of the upper and the lower jaws sometimes associated with macroglossia and a reduced mouth opening complicates or even prevents laryngoscopy, especially in extreme deformities.

Even fiberoptic intubation is not always feasible because of the dorsal positioning of the tongue and the inability to pass through the extremely narrow angle between the root of the tongue and the trachea. Visibility problems originate from the persistent contact of the mucosa with the tip of the optic device and so impair the anesthetist's view. Preoperative fiberoptic laryngoscopy in a patient who is awake without relaxation has to be performed to predict difficulties with intubation. A tracheotomy setup always should be present during attempts at intubation. Extubation should take place only when the patient is fully awake, and the patient should be monitored continuously for at least 24 hours in an intensive care unit. After long operations, which could cause extensive swelling of the masticatory system, these patients should remain intubated overnight in a specialized intensive care unit.

Suggested Reading

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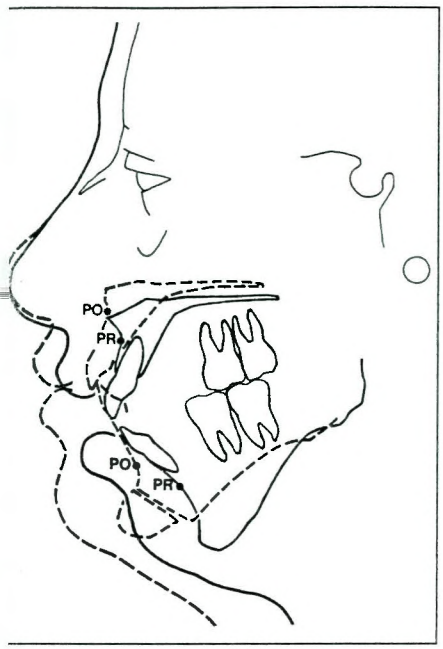
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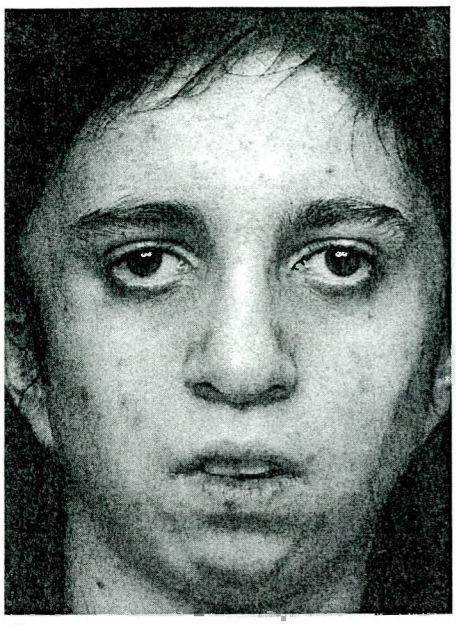
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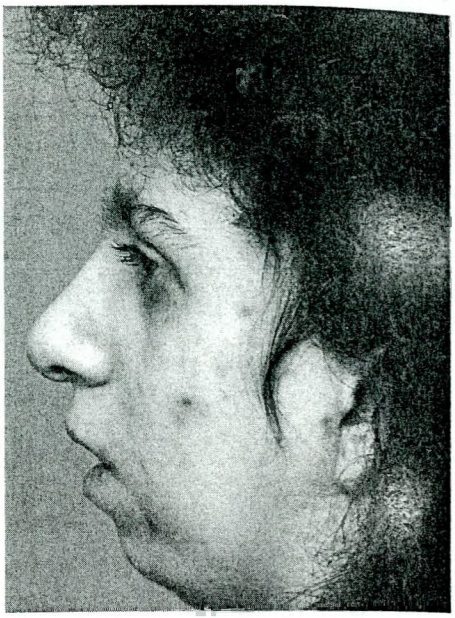
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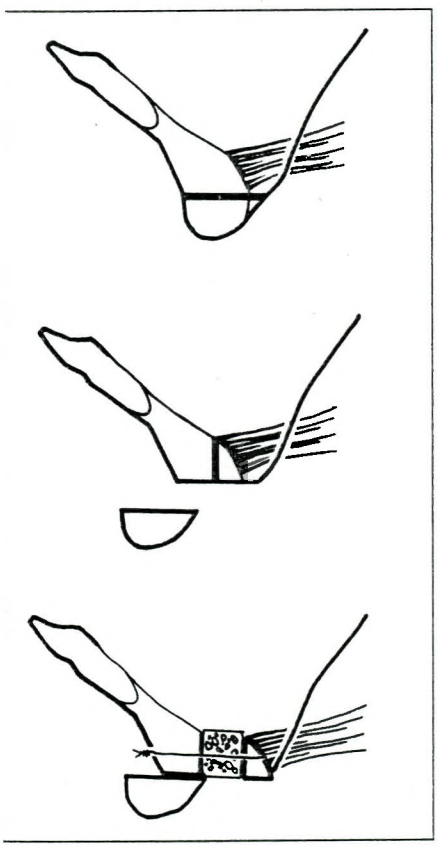


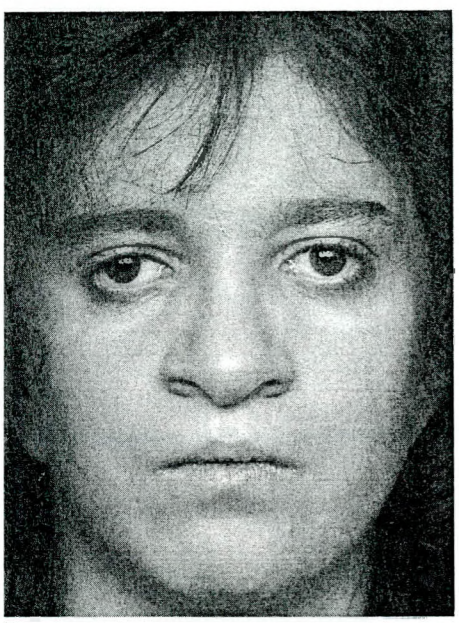


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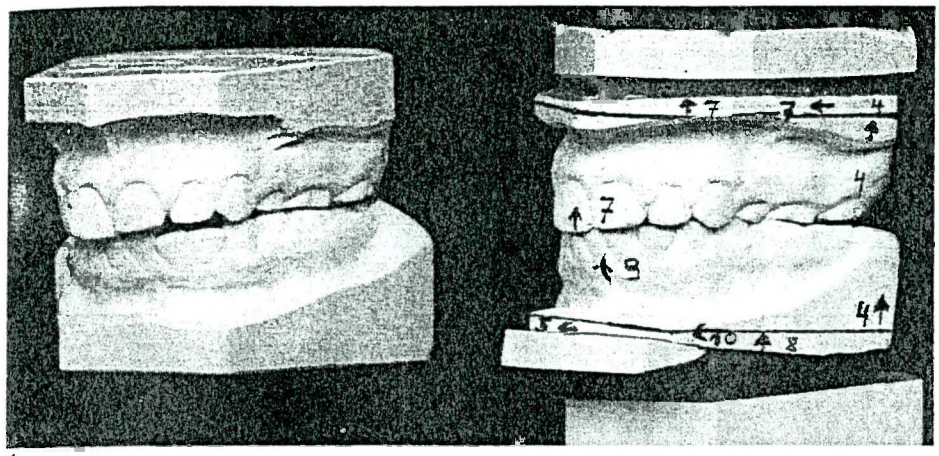


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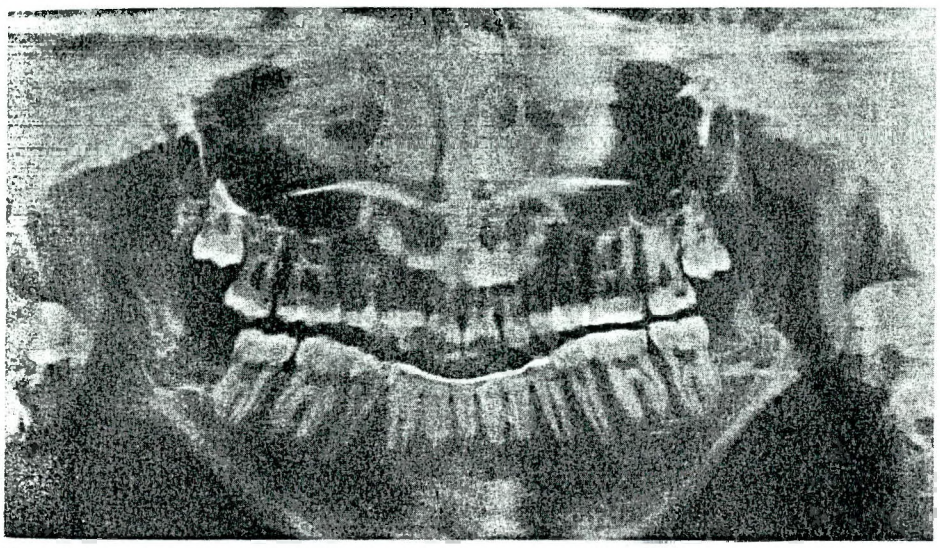


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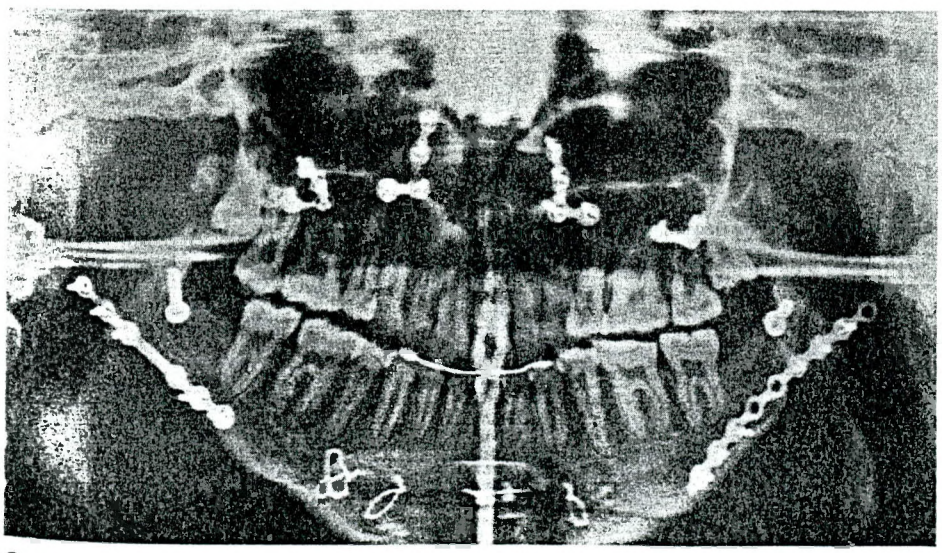
Fig. 38-6. (Continued) The movements of the bones and the soft tissues are demonstrated in the superpositional drawings of the cephalograms (F). To avoid a relapse caused by the pull of the muscle, the bony origin of the genioglossal and geniohyoid muscles is sectioned by the transoral approach (G) after an osteotomy of the chin prominence, sagittal splitting of the rami, and an interpositional lyobone graft are performed. Wiring is used for fixation. This procedure allows restoration of normal facial appearance in Treacher Collins syndrome, as shown in the preoperative (H, I) and postoperative (J, K) photographs. Further augmentation of the zygoma and a nasal correction were declined by the patient. PR = preoperative; PO = postoperative; solid line = preoperative; dotted line = postoperative.



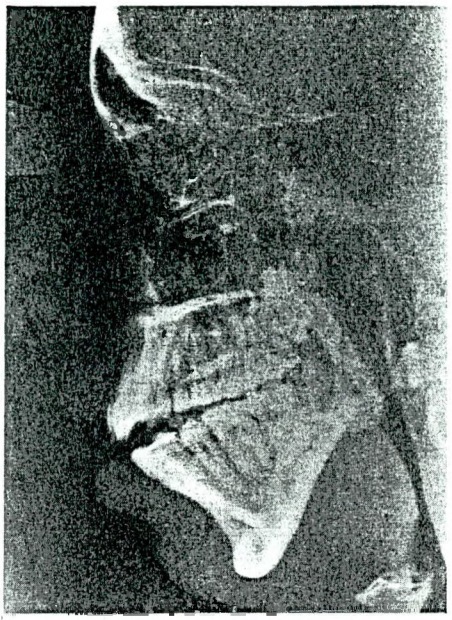
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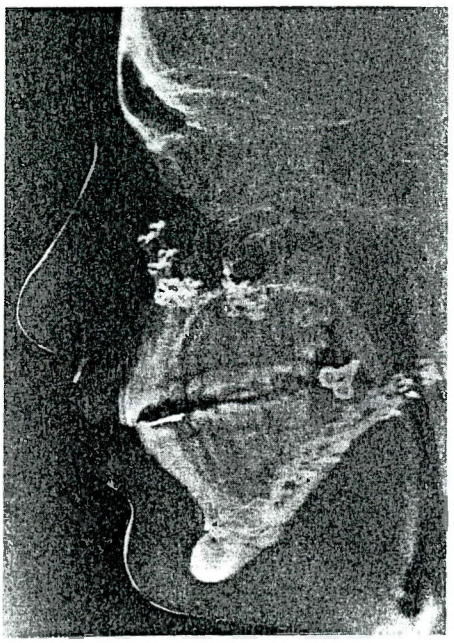
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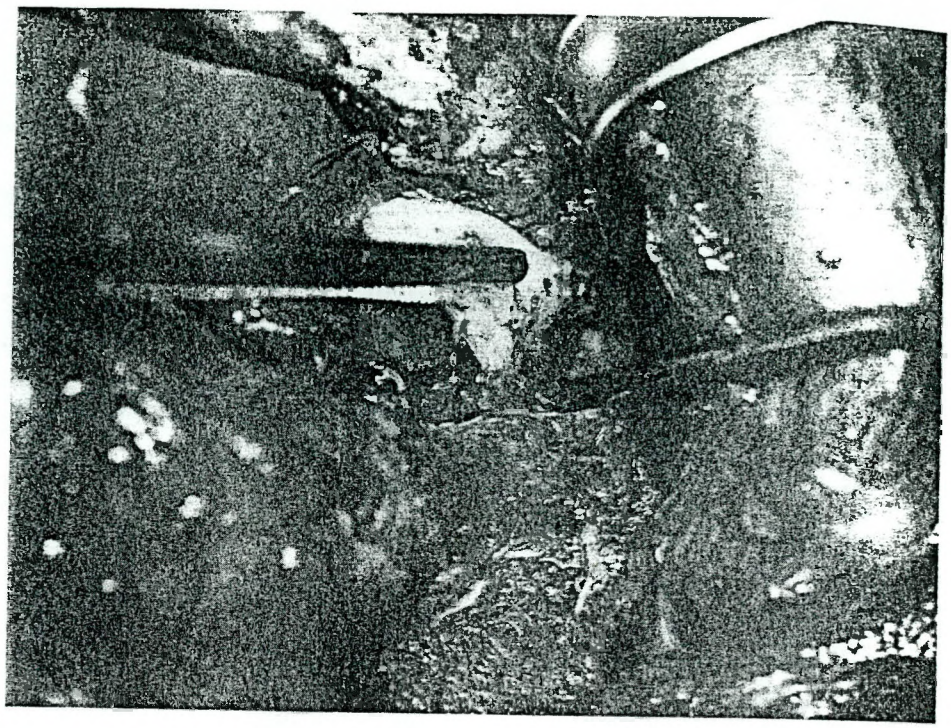


Fig. 38-5. Intraoperative view during removal of the elongated coronoid process.

Removal of Elongated Coronoid Process When Mouth Opening Is Inhibited

Immediately before construction of the zygomatic arch, the coronoid process is palpated within the temporal muscle. The muscle fibers are divided by blunt dissection, and the process is sectioned and removed (Fig. 38-5).

Positioning of Lower and Upper Jaw Depending on the Severity of the Deformity

As soon as orthodontic treatment allows surgical intervention, a cast model operation is performed. This procedure simulates the advancement of the mandible in small deformities or the three-dimensional movement of the whole maxillomandibular complex in more severe deformities (Fig. 38-6A). We have found that it is extremely important to normalize the relation between the length of the upper lip and the position of the maxillary incisors. In severe deformities, the maxilla often has to be raised in the anterior area and tilted downward in the posterior aspect. Simultaneously the mandible is advanced massively. The heavy backward pull of the genioglossus and geniohyoid muscles is eliminated by resection of the posterior mental spine and by interpositioning lyobone into this point (Fig. 38-6G). To ensure the patency of the nasal airways, the inferior turbinate bones must be reduced in instances in which the maxilla has to be raised.

For elongation of the ramus and body of the mandible, long sagittal splitting is used as described by Obwegeser; for maxillary movements, a Le Fort I osteotomy is performed. A Le Fort II osteotomy as advocated by Tessier is rarely indicated and then only in extreme instances of mandibulofacial dysostosis.

Fig. 38-6. Patient with Treacher Collins syndrome who underwent a bimaxillary operation for facial harmony. The cast model operation (A) gives the exact movements of upper and lower jaw. The preoperative (B) and postoperative (C) orthopantomograms detail our technique of segmental fixation using miniplates at the Le Fort I osteotomy level and in the area of the mandibular sagittal splitting (together with positioning screws). The lower wisdom teeth are removed 4–6 months before the operation. The preoperative cephalometric roentgenogram (D) shows the lip incompetence caused by the open bite and the unfavorable relation between the upper lip and the incisors. The postoperative cephalometric roentgenogram (E) reveals the harmony of the facial thirds. ▶

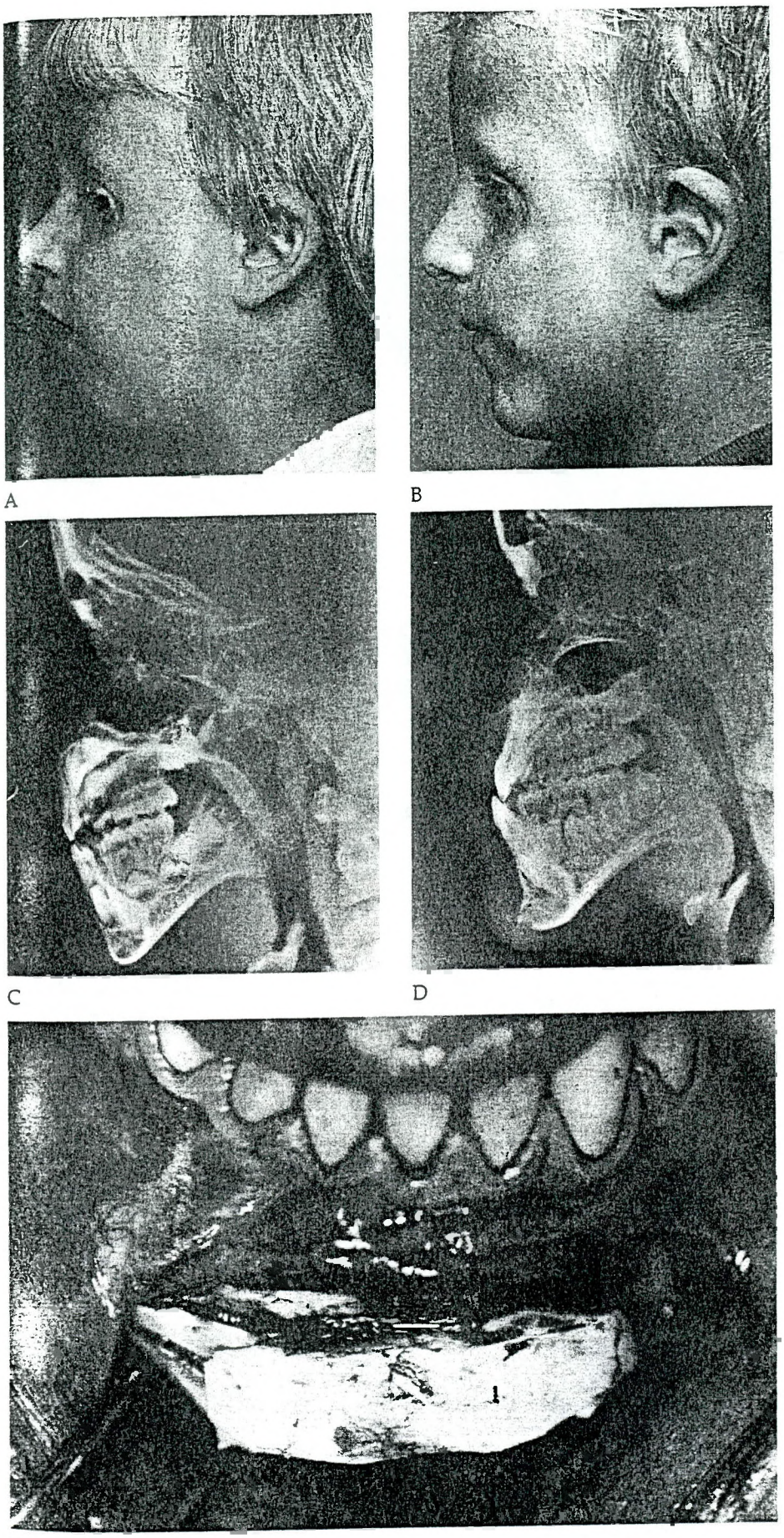


Fig. 38-4. Chin augmentation using lyocartilage. The preoperative view (A) and the condition 6 years postoperatively (B). The preoperative cephalometric roentgenogram (C) shows the caudal position of the tooth buds in the chin region at the age of 5 years. The condition 6 years later (D) shows the ossified lyocartilage seen in the intraoperative photograph (E).



Fig. 38-3. Intraoperative situation in a young patient with Treacher Collins syndrome. The canthopexy wire (w) is led through two bur holes within the supraorbital rim (SOR). PO = periorbit; P = pericranium; LC = lyocartilage.

Elevation of Lower Eyelid and Lateral Canthus

The most effective point for upward pulling of the eyelids is identified, and a woven fine wire or a nylon suture is thread through for fixation of the canthus to the orbital rim, if present, or to the sheets of lyocartilage used for construction of the lateral orbital rim. The eyelids and the canthus are always elevated together; this elevation is not stable without simultaneous lower eyelid support by the lyocartilage grafts (Fig. 38-3).

Augmentation of Chin with Lyocartilage and Construction of a Labiomental Groove

The incision is made in the anterior mandibular vestibule, the periosteum is elevated, and two bur holes are made through the most caudal rim of the chin, where no tooth buds are present. For determination of the most favorable location of the bur hole, a cephalometric roentgenogram and orthopantomogram are used. A lyocartilage block is cut and fixed to the bone surface with wires or suture material (Fig. 38-4).

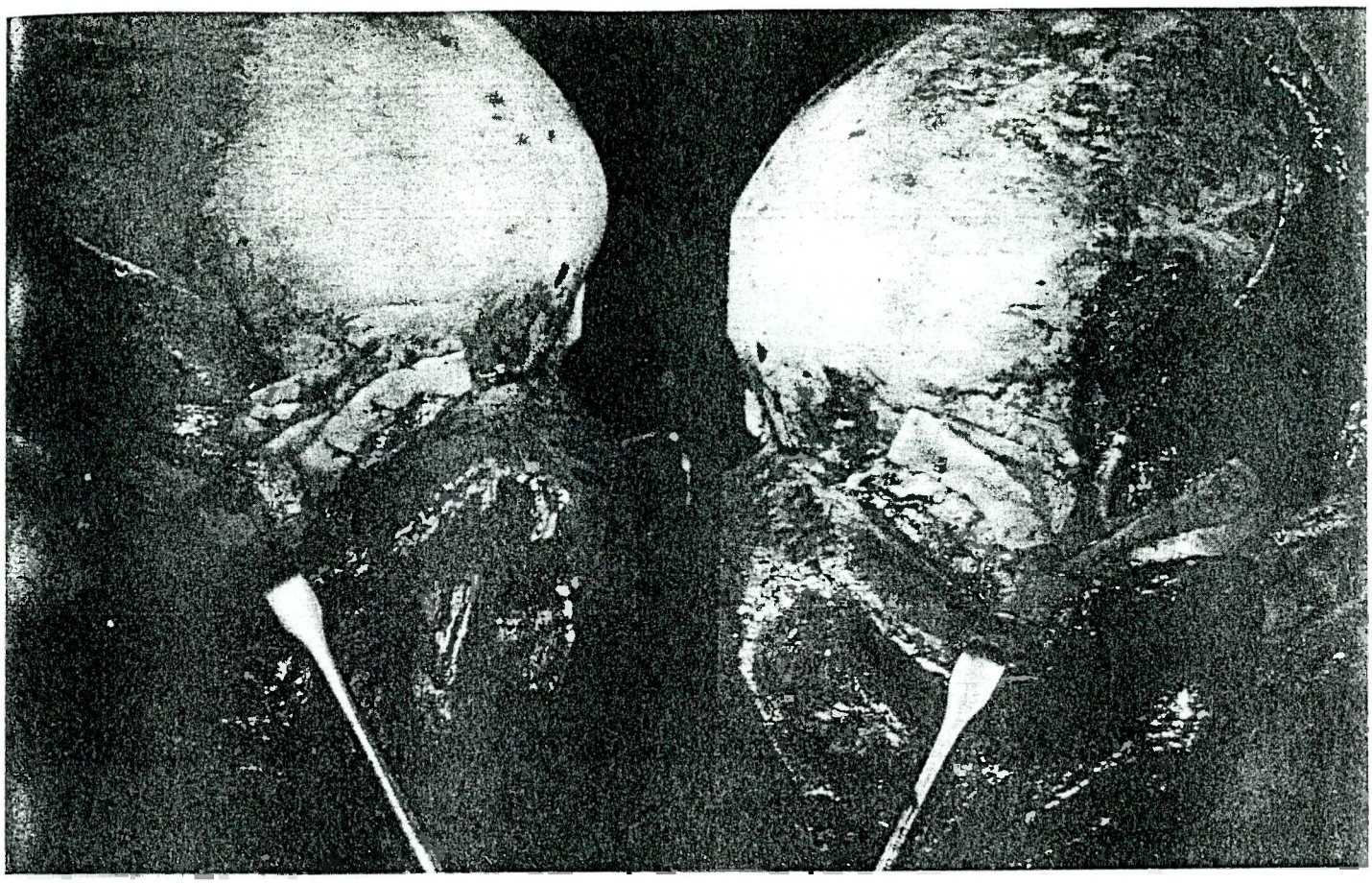


Fig. 38-2. Intraoperative condition of a patient with Treacher Collins syndrome during construction of the lateral orbital rim and the zygomatic arches using slices of lyocartilage.

removed. During the same operation, any ankylosis between the coronoid process and the rudimentary zygomatic arch is removed. Simultaneously the lower eyelid is placed into a normal position by elevation using lyophilized cartilage for infraorbital rim support and lateral canthopexy.

The receded chin prominence is built up with lyocartilage. A simultaneous sliding chin osteotomy is not indicated at this age to avoid damage to the caudally positioned buds of the permanent teeth, located in the chin area. Depilation of the dystopic hairline running in the direction of the angle of the mouth should also be performed at this stage.

Children 6 to 10 Years of Age

Depending on the growth deficiency, the zygomatic and periorbital areas can be repeatedly built up with lyocartilage to achieve good proportion and harmony during growth of the middle third of the face. The indications for these procedures depend on the individual psychological and social needs of the child and the severity of the malformation. Between the ages of 6 and 10 years, orthodontic activator treatment is indicated to develop the hypoplastic mandibular ramus.

Children 12 Years or Older

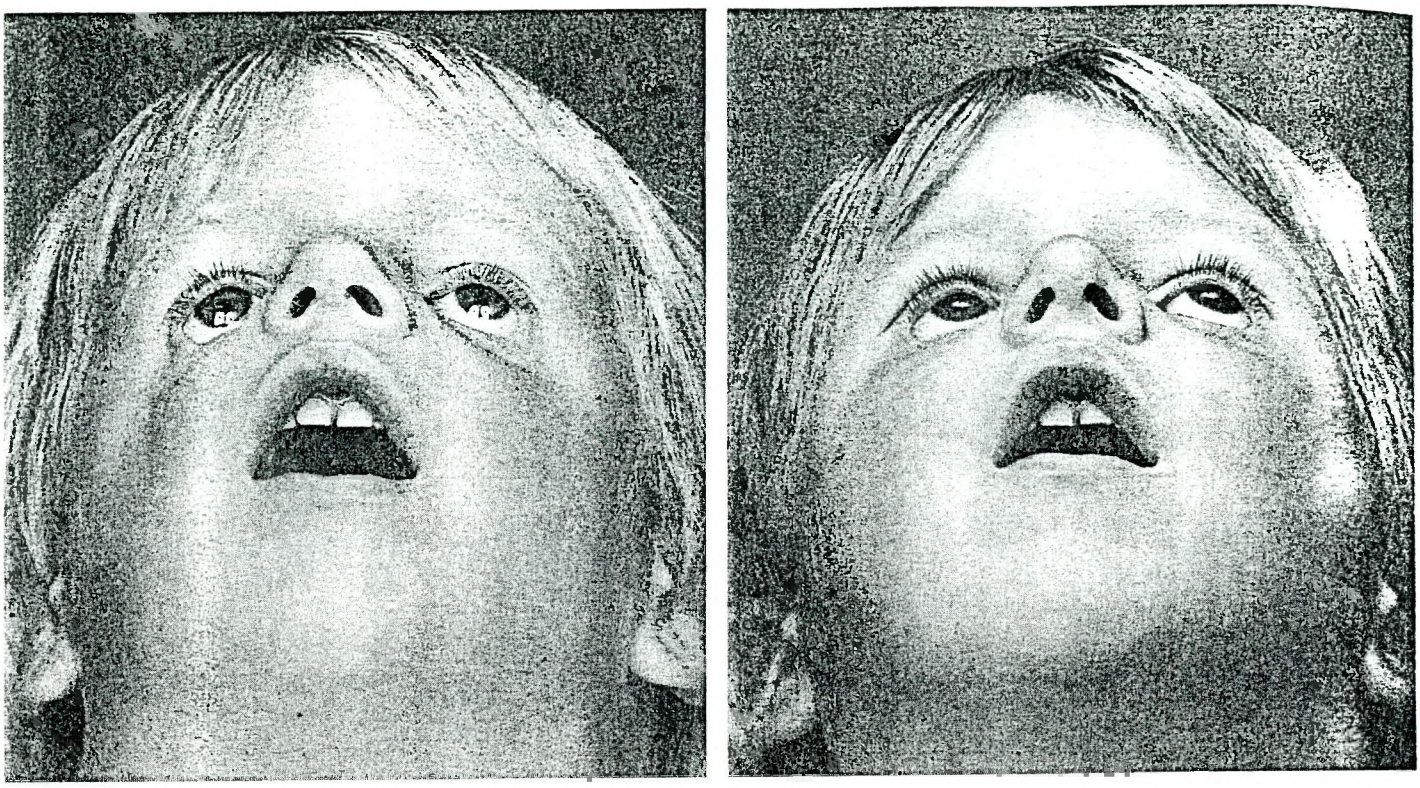
From the age of 12 years on, orthodontic presurgical treatment takes place 14 months for girls and 16 months for boys before the surgical advancement of the mandible and the chin or a combination of operations on the upper and lower jaw is performed. The mandibular operation may be performed before general growth has ceased because of the obvious lack of further condylar growth in most children. Postsurgical orthodontic follow-up care is necessary until facial growth is complete.

Surgical Procedure

Zygomatic-Orbital Defects

We use a bicoronal incision for exposure. Under direct observation the pathologic anatomy is evaluated. The periosteum is carefully elevated along the rudimentary orbital walls and especially in the infraorbital region. Here multiple periosteal cuts are made vertically in the direction of the upward pull of the lateral canthus. Wherever periosteum is identifiable in the zygomatic area, it is incised in a rectangular pattern to allow maximal expansion of the soft tissues.

Lyophilized rib cartilage is cut into 0.6- to 1.0-mm slices with the help of a dermatome. The zygomatic arch and infraorbital rim are constructed using several layers of lyocartilage, fixed with 0.3-mm wires or absorbable suture material. Finally, the orbital floor and lateral orbital wall are built up and the flattened supraorbital forehead area is recontoured. At this point the prolapse of the lateral supraorbital rim is trimmed off using a bur to modify the ovoid form of the orbital aperture (Figs. 38-1 and 38-2).



A B

Fig. 38-1. Five-year-old patient with Treacher Collins syndrome before (A) and after (B) zygomatico-orbital reconstruction with lyocartilage demonstrating a natural contour of the area involved.

3. Homologous lyophilized and sterilized bone and cartilage grafts are used exclusively for surgical reconstruction in all kinds of craniomaxillofacial malformations. These grafts are processed in the tissue bank of the Department of Maxillofacial Surgery at the University of Zurich. The infection rate after the use of lyocartilage is lower than that after an autologous graft. The unique property of lyocartilage processed by our method is its slow transformation into the patient's own bone without resorption. Lyobone is less rapidly resorbed and incorporated than autologous bone and therefore offers more stability. Lyobone is taken from the iliac crest, the calvarium, the femur, the sternum, or the ribs. It is chosen by the surgeon according to the needs of construction or reconstruction. It goes without saying that these materials are not only lyophilized but also sterilized and taken from specially selected donors of a young age group.
4. Craniofacial segments cut with the osteotome are stabilized by miniplates and microplates and by lag or compression screws. Therefore, an intermaxillary fixation can often, but for safety reasons cannot always, be avoided.

Timing of Surgical Treatment

For each craniomaxillofacial malformation there is a special timing protocol for surgical intervention. The timing for mandibulofacial dysostosis is as follows.

Patients with an Isolated Cleft Palate

Palatal closure follows the timing of the Zurich cleft palate treatment at the age of 15 to 18 months. The method used for closure is that of Perko derived from the Widmaier technique. Our convincing speech results after the techniques of palatoplasty were published by van Denmark and associates. Primary orthodontic treatment is not used for patients with isolated cleft palates. An audiologist, who is a member of our treatment team, examines and treats the child according to a speech therapy protocol that is the same as for a child with a cleft palate.

Patients Without a Cleft Palate

Treatment is provided at the age of 2 to 4 years, before the child goes to kindergarten. Construction of the zygomatic arch and bone, the infraorbital and lateral orbital rim and walls, and the lateral parts of the forehead is undertaken at this age using lyocartilage exclusively. At the same time the prolapse of the lateral supraorbital rim is trimmed off using a bur to modify the ovoid form of the orbital aperture. Audiologic examinations with objective audiometry are performed during the first months of life, and hearing aids if necessary are given as soon as possible.

If an elongated coronoid process inhibits the mouth from opening, the process is

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Mandibulofacial Dysostosis

H. F. Sailer Klaus W. Grätz Michael C. Locher

Mandibulofacial dysostosis (Treacher Collins syndrome, Franceschetti-Zwahlen-Klein syndrome) is a rare autosomal dominant craniofacial malformation. Nevertheless, it often occurs as a sporadic mutation in a family previously unaffected. The phenotypic expression of the syndrome affects primarily the first and second branchial arches bilaterally and causes several facial disfigurements. The syndrome is caused by a fetal vascular anomaly that deprives the first branchial arch of its blood supply, which originates mainly from the stapedial artery between the third and fifth weeks of gestation. Poswillo produced a phenotypic copy of this syndrome in mice using teratogenic doses of vitamin A.

Since the early descriptions of the syndrome by Thompson in 1846, Barry in 1889, and Treacher Collins in 1900, many reports have described its facial characteristics—an antimongoloid obliquity of the palpebral fissure, notched lower eyelids, coloboma, ovoid orbital apertures, microphthalmia, hypoplasia of the malar and mandibular bones, a large mouth with irregular teeth and malocclusion, and a deformed external and sometimes middle and inner ear. Associated with these characteristics may be deafness, preauricular sinuses, dwarfism, cardiac and skeletal defects, and abnormalities of the upper airway. Obstructive sleep apnea in Treacher Collins syndrome also has been related to mandibular hypoplasia.

Treatment of this disease is regional reconstructive surgery. In 1982 a radical procedure was developed by Tessier and Tulasne. In its severe expression, this syndrome still represents one of the most challenging reconstructive problems for the craniomaxillofacial surgeon.

Principles of Treatment

The philosophy of treatment of craniofacial deformities and malformations depends on the length of experience of the particular surgeon and the analysis of the achieved results. The Department of Maxillofacial Surgery of the University Hospital in Zurich, Switzerland, has a tradition of almost 40 years of treatment of facial deformities. The Treacher Collins syndrome was one of the first malformations in which the sagittal splitting method and the sliding chin advancement technique were performed in a highly effective and elegant way. Over the years and with the development of craniofacial surgery, the following treatment principles were established in Zurich. Some of them are relevant to the treatment of the Treacher Collins syndrome.

1. Visible scars are considered a defeat in maxillofacial plastic surgery. The incisions routinely used nowadays are the bicoronal and the buccal sulcus incisions. Supraorbital, infraorbital, and submandibular skin incisions have been abandoned. The transconjunctival approach is still accepted and used for exposure and microplating of the infraorbital rim.
2. Autologous bone and cartilage grafts are not used because the donor site morbidity includes pain, infection, and other complications; because these grafts leave visible scars on the thorax, iliac crest, and elsewhere; because hospitalization may be prolonged; and because free autologous onlay bone grafts undergo some degree of absorption regardless of the origin of the graft, whether it be the iliac crest, the ribs, or the calvarium.