The persecution of Christians began in Alexandria during the reign of the Emperor Philip. The first victim of the pagan mob was an old man named Metrius, who was tortured and then stoned to death. The second person who refused to worship their false idols was a Christian woman named Quinta. Her words infuriated the mob and she was scourged and stoned. While most of the Christians were fleeing the city, abandoning all their worldly possessions, an old deaconess, Apollonia, was seized. The crowds beat her, knocking out all of her teeth. Then they lit a large fire and threatened to throw her in it if she did not curse her God. She begged them to wait a moment, acting as if she was considering their requests. Instead, she jumped willingly into the flames and so suffered martyrdom.
OROFACIAL SYSTEMA
Multifunctional systema of the structues

teeth, muscles attaching
mandible, inner and outer
tongue muscles

CNS
fonation
speech
mastication
digestion

Joints

Muscles

Teeth

Jaws

Periodontium (parodontium)

Fast
healing
Infectious
terrain

Esthetic
important

parodont
joints, ligaments
Nuchal muscles
Holy Smokes: 7-year Old Boy Has 526 Teeth Removed From Mouth | My Word[Press]
Ideální vztahy mezi obličejovými a zubními komponentami: Cefalometrická analýza dokáže rozlišit a vyjasnit zubní a skeletální příspěvky k malokluzím, které představují identické dentální vztahy.

The ideal relationships of the facial and dental components can be represented as shown in A. Cephalometric analysis can distinguish and clarify the differing dental and skeletal contributions to malocclusions that present identical dental relationships.
31-year-old female patient with severe skeletal and dental Class III malocclusion and unilateral crossbite before treatment.
Viscerocranium
Facial skeleton

Obličejová kostra
Facial skeleton
These images of a human and early human (Paranthropus boisei) skulls allowed scientists to compare bite forces.
3D skeletal color maps of superimpositions of T2 over T1 registered at the anterior cranial base with a scale of -4 to +4 mm. Red represents outward displacement of T2 relative to T1. Blue represents inward displacement.
Oblouky zubní Dental arches

Tvar čelistí Jaw alveolar feature

Uzavřenější (elipsa parabola)

Kuželosečky

Otevřenější (parabola, hyperbola)
Space (leeway space): 
Difference between mesiodistal width of the support zone (c-m1m2) and group of the permanent teeth (C-P1P2)
maxilla- 1.5mm
mandible- 3mm

This is an consequence of the different position and form of m2 and P2
Formation of the skull pre- and early postnatal
The main events determining skull form

Brain growth; ossification of synchondrosis sphenooccipitalis; expanding of eye bulb, muscle drawing; nasal septum growth; teeth eruption

Growth types:
- General – to 70% final size 6 yr
- Cranial – to 80% final size 6 yr
- Facial – to 80% final size 6 yr

Pořadí:
- Calvaria
- Maxilla
- Mandibula
**Postnatal:**
Width of face is enlarged slowly and is finishing that early
Face high is enlarged more and finish late
After year 40 resorption is up the aposition; Mandible grows very long

**Jaw growth:**
- **anterior rotation**
- **Physiologic** (ventrocaudal)
- **Total** (whole) influences also activity of the surrounding structures matrix or apparent rotation
- **rotation of the matrix:** (intramatrix rotation, angular remodelling)
Timing of Puberty

There is a great deal of individual variation, but puberty and the adolescent growth spurt occur on the average nearly 2 years earlier in girls than in boys (Figure 4-3). Why this occurs is not known, but the phenomenon has an important
Growth acceleration of the jaw growth relatively follows weight increase if you are young.
Growth at sutures

- Fronto-nasal
- Fronto-maxillary
- Zygomatic-temporal
- Zygomatico-maxillary
- Pterygo-palatine

- All are oblique; more or less parallel to each other
- Downward and forward growth

- Suture is a tension adapted tissue
- Suture doesn't grow when transplanted
- Growth takes place in untreated cases of cleft palate
Growth of skull basis

1 yr  os frontale (sinus frontalis)
4 yr  cribriform lamina of ethmoidal bone
7 yr  spheno-ethmoid, -frontal; fronto-sphenoid

resorptive areae – around lacerum foramen, jugular fossa, medial lamina of pterygoid process

nazozygomaxillar complex – from sutures surrounding maxilla

infrazygomatic crest – sutura palatina transversa  

after Enlow
Expanze švů mezi lícní kostí, kostí čelní, spánkovou a maxilou

Expansion following sutures:
- zygomaticomaxillary
- zygomaticofrontal
- zygomaticotemporal
cranial growth
very low pubertal spurt  5-7 year  size about 90%  final size

facial growth
pubertal spurt is proportional  6 year  cca 80%  final size

skeletal (general) growth
pubertal spurt accelerate  about 6 year  cca 70%  final size
Neonatus

Face width - starts to growth earlier

Neonatus
Orbit and piriform aperture.
the rounded orbit shape initially increases its size, while maintaining the shape. later the latero-inferior border presents a more pronounced resorption. the maximum measurement of piriform aperture increases with aging, being prominent in skulls >50 years.
Maxilla and mandible.

There is an increase in maxillary resorption with aging, which is associated with a decrease in skin fat and collagen contents and leads to midface soft-tissue descent. Also, with increasing age, the mandible loses its vertical projection and becomes more fragile.
Zygoma.

Considering the skull in anatomic position, the zygoma becomes more retropositioned with aging, with an increasing angle between an imaginary vertical line and the anterior border of the zygoma.
Gender differences between male and female skulls
The darker areas are those of the greatest bone loss. The stigmata of aging, manifested by the facial soft tissues, corresponds with the areas of weakened skeletal support.

Orbital aging. The superomedial and inferolateral aspects of the orbit have the greatest tendency to resorb. This contributes to the stigmata of periorbital aging such as increased prominence of the medial fat pad, elevation of the medial brow, and lengthening of the lid-cheek junction.
Zesílená a zeslabená místa obličejového skeletu

Thickened and weakened areas of the facial skeleton
Patrová deska
Palate plate
Podle Defeze 1985
After Defeze 1985
Classification of the facial bones into degree of resistance to impact
Jaké linie se především sledují

Which lines are followed predominantly
Midface buttresses; tension and traction lines

- Three buttresses allow face to absorb force
  - Nasomaxillary (medial) buttress
  - Zymaticomaxillary (lateral) buttress
  - Pterygomaxillary (posterior) buttress
Transfer of chewing pressure to skull structures

**FIG. 4.8.** Horizontal buttresses of the skull. The purple areas represent areas of thicker facial bone that are less likely to fracture than intervening areas.

**FIG. 3.9.** Vertical buttresses of the skull. The purple areas represent areas of thicker facial bone that are less likely to fracture than intervening areas. Depending on the development of the sinuses, the buttress may follow the supraorbital rim and skirt the frontal sinus.
Power transfer in the skull basis
Traction and tension lines in skull base
Trajectories inside mandible trabeculae

Upraveno z Langa 1995
Přenos tlaku a tahu v dolní čelisti pruhy zhuštěné trámčiny

Tlakové a tahové linie v dolní čelisti

Tillmann et al. 1983)
Přenos tlaku a tahu v dolní čelisti

Trajectorium dentale
(to proc. condylaris)

basilare
(from corpus to neck as posticum)

marginale
(in angulus)

praeceps
(to linea mylohyoidea
and to linea obliqua externa)

copolans
/incisura mandibulae/

transversum
(from proc.coronoideus to angulus)

radiatum
(below each alveolus)

podle Lang 1995
Etude expérimental sur les fractures de la machoire supérieure (1901)

Location of the fracture lines:

- Medial orbit wall
- Lateral orbit wall to sutura frontozygomatica
- Processus pterygoideus
- Basal part of the nasal septum - septum nasi
- arcus zygomaticus
Prvá fáze erupce stálých zubů
First stadium of eruption of the permanent teeth
6 let

Téměř současná erupce M1 v dolní čelisti i horní čelisti a středních řezáků v obou čelistech

Near-simultaneous eruption of rtg mandibular i1´s, m1´s and maxillary m1´s
Dental age 8

Eruption of the maxillary lateral incisors I2

Dental age 9

Maxillary I2’s have been in place for 1 year; other I’s and M1’s are complete. Root development of the maxillary C’s and P2’s are beginning, while about one-third of the root of mandibular C and P1’s have been completed.

Dental age 11

More or less simultaneous eruption of the mandibular C’s, P1’s, and maxillary P1’s.
Dívka 8 let
Girl 8 year

Chlapec 8 let
boy 8 year
Obvyklá ＿normální＿erupce
Physiological eruption

Zuby (v tomto případě moláry) vstupují do okluse
a ramus mandibulae se současně vertikálně prodlužuje

The teeth (in this case the molars) enter the occlusion and the mandible ramus is simultaneously vertically elongated
Dívka 11 let
Girl 11 year

Chlapec 11,5 let
boy 11,5 year
Dívka 14,5 let
Girl 14,5 year

Chlapec 11,5 let
boy 11,5 year
Eruption of the remaining succedaneous teeth (maxillary C and maxillary and mandibular P2’s) and typically a few month later the maxillary and mandibular M2’s

the roots of all permanent teeth (except wisdom teeth) are complete; crowns of M3 is seen
Girl 20 year

Boy 20 year
Rozdíl ve velikosti dočasných a stálých molářů na RTG

Vztah mezi stálými moláry má tendenci se měnit (vzájemně posunout) pod vlivem růstového spurtu v dospívání (viz šipky).

Růst čelisti a posun stoliček určuje konečný molární vztah ve stálém chrupu.

Okluse mezi dočasnými i a stálými moláry

Propojenost žvýkacích ploch mezi dočasnými moláry

Propojenost žvýkacích ploch mezi stálými moláry

The size difference between the primary molars and permanent premolars, as would be observed in a panoramic radiograph.
Muž 40 let
The palatine shelves are in the vertical position on each side of the tongue. The shelves have elevated, but they are widely separated. The primary palate has fused with the secondary palatal shelves.
Rozštěpy

Nespojení zárodečných výběžků obličeje
Vrozené a teratogenní vlivy
(doba kritické periody a délka působení látky)

tři kritické periody:
25.-35. den izolovaný rozštěp rtu
37.-53. den izolovaný rozštěp patra poškozením plotének
53.-57. den izolovaný rozštěp patra zpomalením růstu dolní čelisti

Diabetes
Hypoglykemické stavy
Epilepsie
Stres
kortikoidy

! Preventivně léčit rozštěpy do druhého měsíce téhotenství!
Včas prenatálně diagnostikovat po třetí kritické periodě a zvážit přerušení téhotenství

20 procent – dědičnost
10 procent – zevní prostředí (matka, rtg.)
70 procent - nezjištěno