3D comparison of swelling after orthognatic surgery by using Hilotherm®

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Problems with traditional coolants

- Aggressive cold treatments
- Temperature regulation
- Coolant replacement
- Increased burden on the nurses and health care workers

Thorsson et al. 1985
Skin temperature and blood flow after cold application

Thorsson et al. 1985
Hilotherm cooling mask
Prospective randomised clinical trial

- Aim of the study
- Operation technique
- Patients and method
- Results
- Conclusion
Aim of the study

Compare cool laps vs. Hilotherm

- 3D measurement of swelling in ml
- Neurological complain
- Pain-Score
- Patients satisfaction
Operation techniques

- Bimaxillary osteotomy
- Advancement of maxilla
- Advancement of mandible
- Mandibular setback
Patients and Method

- 30 patients, 22 f and 8 m
- average 28.26 years (18-51)
- orthognatic diseases
- no systemic diseases
- no allergy or infections
- no syndroms
- no cleft patient
- no coagulation drugs

Graph showing the age distribution of patients using two methods: cool laps and Hilotherm.
Patients and Method

- 30 patients, 22 f and 8 m
- average 28.26 years (18-51)
- orthognatic diseases
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Patients and Method

Method

- 15 patients were treated daily 16 h for 3 days with hilotherm
- 15 patients were treated daily 16 h for 3 days with cool laps
- 3D optical Scan:
- \{pre Op (T0), 2nd (T1), 3rd (T2), 4th day (T3)\}
- Pain score \{2nd, 3rd, 4th day\}
- neurological score \{4th day and after 6 month\}
- standard painkillers
- after 6 month 3D scan (T4) and questionnaire
3D-SHAPE Facescan®

- Vogelgesicht
- Tracheostoma
- Z. n. frühkindlicher Infektion
3D-SHAPE Facescan®
3D-Measuring solution from ear to ear by using a mirror construction and digital texture
Alligned shell deviation

Create panel for cut off
Volumetric measurement

Reference mask 6 month

T4
Volumetric measurement

Reference mask 6 month

2nd day

T4

T1

153, 27 ml

T4 vs. T1
Volumetric measurement

Referencemask 6 month

T4 vs. T1

153, 27 ml

T4 vs. T2

123, 58 ml
Volumetric measurement

Reference mask 6 month 2nd day 3rd day 4th day

T4 vs. T1 153, 27 ml 123, 58 ml 111, 69 ml
T4 vs. T2 T4 vs. T3
Volumetric measurement cool laps
Volumetric measurement cool laps
Profil digital texture with volumetric measurement (ml)

127,26
144,54
111,80
5,37
Volumetric measurement Hilotherm
Profil digital texture with volumetric measurement (ml)
Results
Average swelling rate
cool laps vs. Hilotherm

Σ/15: 119.06

2nd day
3rd day
4th day
6 month

Cool laps
Hilotherm
Results

Average painscore

cool laps vs. Hilotherm

\[\sum_{15}^{\Sigma}: \text{Cool laps}\]

\[\sum_{15}^{\Sigma}: \text{Hilotherm}\]

\[\bar{x}:\]

\[\bar{x}:\]

2nd day

3rd day

4th day

Pain level

0

2

3

5

7

6.60

5.93

4.33

4.01

2.79

Cool laps

Hilotherm
Results

Neurological Score

4th day 6th month

2.87 2.07

1.43 1.01

Cool laps Hilotherm
Results
Satisfaction

1: very good
4: bad

2.93
1.79

Cool laps

Hilotherm
State of the art
6 month after surgery
State of the art
6 month after surgery
Conclusion

- confirmed shown a new method to measure facial swelling
- less swelling in ml
- less pain
- less neurological complains
- more satisfied patients