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## Facial Bone Lengthening Apparatus With Expander And Miniplates.

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Since 1869, bone lengthening has been pursued; when Langenbeck (13) tried growing a shortened bone extremity utilizing for this an arteriovenous fistula in the thigh.

At the beginning of this century, Codovilla (1905) (5,14) introduced bone lengthening methods for lower limbs.

**UNITERMS:** Bone lengthening; expander; silicone.

Since 1869, bone lengthening has been pursued; when Langenbeck (02) tried to lengthen a shortened bone extremity utilizing for this an arteriovenous fistula in the thigh.

In the beginning of this century, Codovilla (1905) (03), introduced bone lengthening methods for lower limbs, which lately, with the advent of the external fixation apparatus, such as those created by Anderson and Wagner (13) led to satisfactory results.

However, since 1951, Ilizarov (4,5) in the USSR developed an external fixation system with circular hoops, that only recently came through the citations of Italian orthopedists (1,9).

Although bone lengthening of the lower and upper limbs is now completely introduced in the clinics, facial bone lengthening, mainly the mandible, has only lately been researched (7,8,11,19). The researchers (6,7,8,) have been developing the mandible lengthening through an external fixation apparatus similar to the one utilized for lower limbs. The disadvantages of this method is the discomfort, the risk of contamination and the scar on the face.

We are now developing an apparatus and method which could avoid these mentioned problems.

Our apparatus would join the advantages of both the tissue expanders (10,11) and the external bone lengthening apparatus.

There would be two miniplates fixed by screws in the bone extremities undergoing the lengthening treatment, and connected to a silicone bellows fixed between the two miniplates. Through a remote valve the expander would be filled and the silicone bellows distention would promote the miniplates distraction, and consequently the bone extremities distraction.

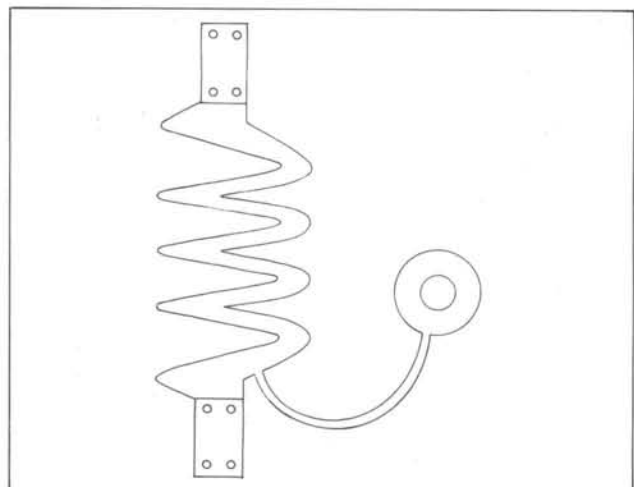


Fig.1 - Facial Bone Lengthening Apparatus.  
M - miniplates E - expander V - valve

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## REFERENCES :

1. ALDEGHIERI, R.; TRIVELLA, G. & LAVINI, F. Epiphyseal distraction : chondrodiastasis. **Clin Orthop** **241**: 117, 1989.
2. CAMPBELL, W. C. - Campbell's operative orthopedics. Ed. by A H Crenshaw, 7<sup>a</sup> ed., St Louis, Mosby, 1987, vol. 4, p. 2699.
3. COLEMAN, S. S. & STEVENS, P. M. - Tibial lengthening. **Clin Orthop** **136**: 92, 1989.
4. ILIZAROV, G. A. - A method of uniting bones in fractures and an apparatus to implement this method. USSR authorship certificate 98471 filed 1952. In Ilizarov, G. A. The tension-stress effect on the genesis and growth of tissues. The influence of stability of fixation and soft-tissue preservation. **Clin Orthop** **238**: 249, 1989.
5. ILIZAROV, G. A. - The tension-stress effect on the genesis of distraction. **Clin Orthop** **239**: 263, 1989.
6. KARP, N. S.; SCHREIBER, J. S.; THORNE, C. H. M. & MCCARTHY, J. G. - Membranous bone lengthening : a serial histologic study. **Plastic Surgical Forum**. 59th Annual Scientific Meeting, Boston, 1990.
7. KARP, N. S.; THORNE, C. H. M.; MCCARTHY, J. G.; SISSONS, H. A. - Bone lengthening in the craniofacial skeleton. **Ann Plast Surg** **24**: 231, 1990.
8. MCCARTHY, J. G.; SCHREIBER, J. S.; KARP, N. S.; THORNE, C. H. M. & GRAYZON, B. G. - Bone lengthening of the human mandible by gradual distraction. Annals of the IV Biannual Meeting of the International Society of Craniomaxillofacial Surgery. Santiago da Compostela. 29, 1991.
9. MONTICELLI, G. & SPINELLI, R. - Distraction epiphysiolisis as method of limb lengthening. I. Experimental study. **Clin Orthop** **154**: 254, 1981.
10. NEWMANN, C. G. The expansion of an area of skin by progressive distention of a subcutaneous balloon. **Plast Reconstr Surg** **19**: 124, 1957.
11. RADOVAN, C. - Adjacent flap development using expandable silastic implant. Presented at the Annual Meeting of the America Society of Plastic and Reconstructive Surgeons, Boston, Massachusetts, 1976.
12. SNYDER, C. C.; LEVINE, G. A; SWANSON, H. M. & BROWNE, E. - **Plast Reconstr Surg** **51**: 506, 1973.
13. WAGNER, H. - Operative lengthening of the femur. **Clin Orthop** **136**: 125, 1978.

## RESUMO

Os autores propõem a utilização de um alongador ósseo composto de duas miniplacas. Através de uma válvula remota o expansor seria enchido e a distensão da bolsa promoveria afastamento das miniplacas e consequentemente das extremidades ósseas.