

## Self-curing Acrylic in the Treatment of Unstable Zygomatic Arch Fracture

by

*Orhan Güven, D.D.S., Ph.D.*

(Received 7 March and accepted 17 March 1988)

Key words: fracture, zygomatic arch, traumatology

### Abstract

Isolated and delayed zygomatic arch fracture presents as a depression on the side of the face. The majority of zygomatic arch fractures are stable when reduced because of interdigitation of the bone ends and because the fragments are held in a vertical plane by the temporal fascia above and by the masseter muscle below. Occasionally, however, arch fractures are unstable and require active fixation. A case is described in which circumferential wires tied over a self-curing acrylic bow on the face were used for the fixation of a delayed zygomatic arch fracture.

### Introduction

Fractures of the zygomatic complex constitute the most common fractures of the middle third of the facial skeleton. Fractures of the zygomatic arch commonly occur at the same time as fractures of the zygomatic bone, but it is well known that zygomatic arch fractures can occur separately<sup>[1]</sup>. Isolated arch fracture typically presents as a pond-shaped depression on the side of the face<sup>[2]</sup>. The time of the reduction is important. If the patient is the victim of a traffic accident, there are frequently multiple fractures and sometimes he may be in shock. Zygomatic fracture reduction is therefore often delayed until more important structures are treated. Also, the signs of zygomatic fracture may be obscured by edema and lacerations. Swelling of the tissues overlying a depressed fracture can round out the face so that both sides of the face appear equally full.

Most zygomatic arch fractures do not require active fixation after reduction. After replacement of the zygomatic arch, in the week following the injury, the fragments are held in the correct position by the masseter and masseteric fascia below and by the temporal fascia above<sup>[1]</sup>. Although fragments can be reduced after the first week, adequate stabilization cannot be provided. After several months, replacement of the fracture is almost impossible. In this article, a technique utilizing an extraoral self-curing acrylic appliance for unstable zygomatic arch fractures is presented.

*Dept. of Maxillofacial Surgery, Faculty of Dentistry, University of Ankara, Besevler, Ankara, Turkey.*  
Contact Address: Doç. Dr. Orhan Güven, Tunalı Hilmi Caddesi, No. 26/2, Küçük Esat, Ankara, Turkey.

### Case Report

A 29-year-old man was referred to our clinic with a depression on the left side of his face. Seven weeks previously he had been involved in a traffic accident. He



Fig. 1. Submento-vertex radiograph showing depressed zygomatic arch

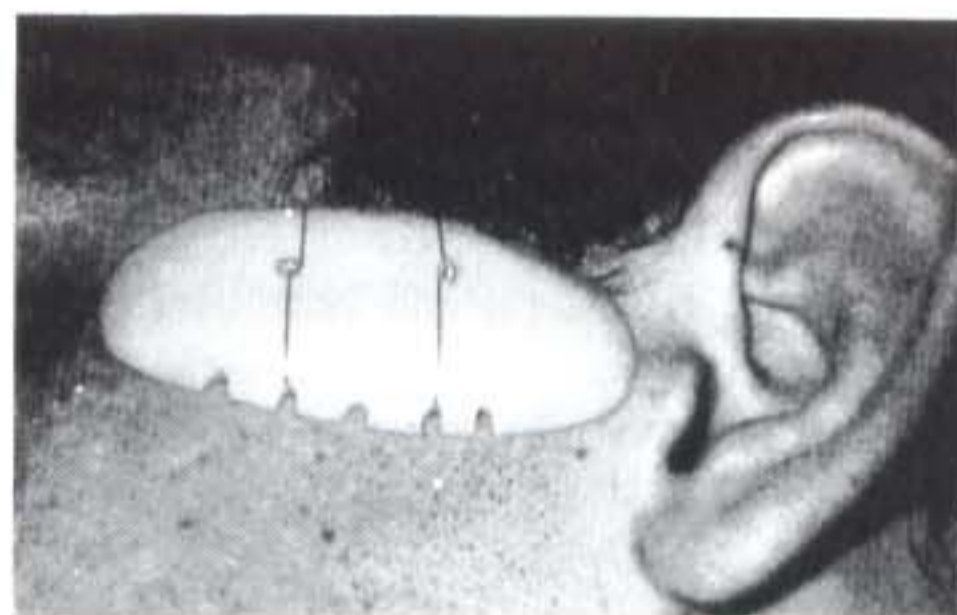


Fig. 2. Profile view demonstrating position of the acrylic bow



Fig. 3. Radiograph showing reduction and fixation of the fracture

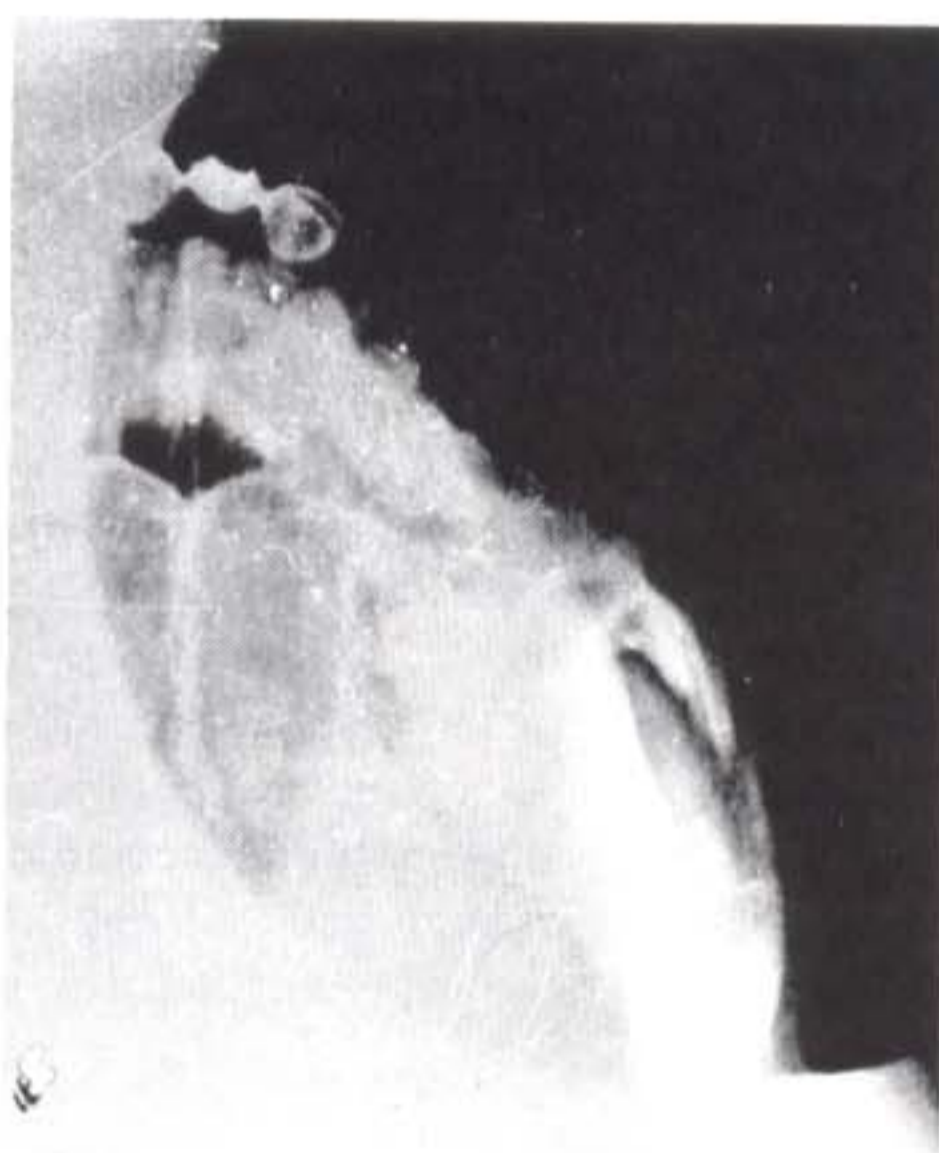


Fig. 4. Radiograph taken 4 months post-operatively

had been treated at the emergency department of a neighboring hospital, and finally he was referred to our Department of Oral and Maxillofacial Surgery. His medical history was unremarkable. Clinical and radiographic examinations revealed a zygomatic arch fracture on the left side (Fig. 1).

An impression was taken from the undamaged side of the face to provide a model for symmetrical reduction of the zygomatic arch. A plaster model was prepared and a self-curing acrylic bow was constructed on the model. The thickness of the acrylic bow was about 2 mm. To prevent undesirable movement, some retention sites were trimmed on the upper and lower edges of the bow. To avoid skin irritation, the edges of the bow were polished and smoothed<sup>[3]</sup>.

The depressed arch fracture was reduced from above by the GILLIES temporal approach<sup>[4]</sup>. Two circumferential wires were placed around the zygomatic arch and tied over the above-described self-curing acrylic bow (Figs. 2 and 3). An iodoform vaseline gauze was placed between the skin and the acrylic bow to prevent skin necrosis. Two weeks later, the external acrylic bow was removed. Submentovertex radiography 4 months postoperatively revealed that the fracture was satisfactorily healed (Fig. 4).

### Discussion

Many methods have been described in the literature for repositioning zygomatic arch fractures<sup>[5-7]</sup>. Usually in cases of earlier reduction, the fragments remain in a stable position. If the reduction has been delayed and alignment of the fragments cannot be achieved or maintained, surgical manipulation at one or all fracture sites, particularly at the zygomatic arch, are necessary. In this method, extreme care must be taken not to injure any branches of the facial nerve. Furthermore, an incision scar will remain on the face.

Several extraoral fixation methods have been proposed for fixing unstable fractures. Extraoral fixation can be done by placing a wire around the zygomatic arch and attaching the wire to a plaster headcap using a stainless steel synthetic bow that extends from ear to ear<sup>[8]</sup>, or using a Fox eye shield<sup>[9]</sup>.

A Frac Sur Unit (Roger Andersen) is inserted through the skin into the depressed zygoma. The surgeon elevates and positions the fragments by grasping the connecting rod between the pins, then extraoral traction, applied to appropriately placed bars extending from a plaster of Paris headcap, should be used<sup>[10]</sup>. Often the patient cannot tolerate holding the described appliances required for these methods.

Recently VAN DER WALL and DE VISSCHER<sup>[1]</sup> described a modified method for fixation of unstable zygomatic arch fractures. Similarly, we used an acrylic bow for extraoral traction<sup>[3,11]</sup>. This technique is less obstructive and more comfortable for the patient. In employing this appliance the operative procedure can be simplified and the incidence of complications decreased. Moreover, taking an impression from the undamaged side of the face and preparing an appliance similar to the intact zygoma should facilitate better and symmetric anatomic repositioning.

### References

- [1] VAN DER WALL, K.G.H. and DE VISSCHER, J.G.A.M.: Fixation of the unstable zygomatic arch fracture, *J. Oral Surg.*, **39**, 783-784, 1981

- [2] JONES, G.M. and SPECULAND, B.: A splint for the unstable zygomatic arch fracture, *Br. Oral Maxillofac. Surg.*, **24**, 269–271, 1986
- [3] GÜVEN, O.: Stabilization of the delayed zygomatic arch fracture, *Int. J. Oral Maxillofac. Surg.*, **16**, 445–447, 1987
- [4] GILLIES, H.D., KILNER, T.P. and STONE, D.: Fractures of malarzygomatic compound, with description of a new x-ray position, *Br. J. Surg.*, **14**, 651, 1927
- [5] BROWN, J.B., FRYER, M.P. and McDOWELL, F.: Internal wire-pin fixation for fractures of the upper jaw orbit, zygoma and severe facial crushes, *Plast. Reconstr. Surg.*, **9**, 276, 1952
- [6] KRUGER, G.O.: *Textbook of Oral Surgery*, 4th ed., The C.V. Mosby Co., St. Louis, U.S.A., 1972
- [7] LORE, J.M.: *An Atlas of Head and Neck Surgery*, 2nd ed., W.B. Saunders, Philadelphia, U.S.A., 1973
- [8] GEHRE, G.: Zur retention chirurgisch reponierter jochbein- und jochbogenfracturen, *Dtsch. Zahnärztl. Z.*, **22**, 1451, 1961
- [9] BLEVINS, C. and GROSS, B.D.: A method of fixation of the unstable zygomatic arch fracture, *J. Oral Surg.*, **37**, 602, 1979
- [10] ARCHER, W.H.: *Oral and Maxillofacial Surgery*, 5th ed., W.B. Saunders, Philadelphia, U.S.A., 1975
- [11] GÜVEN, O.: A comparative study on maxillofacial fractures in Central and Eastern Anatolia, *J. Cranio-Max. Fac. Surg.* (in press)