

Journal of Maxillofacial Surgery

Official Publication of the European Association for Maxillo-Facial Surgery

Editor-in-Chief:

H. P. M. Freibofer
Nijmegen, The Netherlands

Assistant Editors:

P. B. Clarke
Aberdeen, Scotland
R. A. C. A. Voorsmit
Nijmegen, The Netherlands

Editorial Board:

K. Bitter, Frankfurt
R. Brusati, Parma
J. Conley, New York
P. Egyedi, Singapore
R. Fries, Linz
R. J. Goelin, Minneapolis
I. R. H. Kramer, London
L. A. Nwoku, Lagos
H. L. Obwegeser, Zurich
D. K. Oosterhout,
San Francisco
G. Pfeifer, Hamburg
V. Popescu, Bucharest
N. L. Rowe, Woking
A. Škockljev, Belgrade
P. J. Sloorweg, Utrecht
P. Tessier, Paris
J. M. Vaillant, Paris

Reprint

© Georg Thieme Verlag Stuttgart · New York
Nachdruck nur mit Genehmigung des Verlags

Transfacial Access to the Retromaxillary Area

Francisco Hernandez Altemir

Department of Oral and Maxillo-Facial Surgery (Head: F. Hernandez Altemir, M.D., D.M.D.), Hospital "Miguel Servet", Zaragoza, Spain

Submitted 7. 5. 1984; accepted 10. 7. 1985

Introduction

There are territories which are quite difficult to reach by conventional surgical techniques. The consequences are mutilation of or damage to adjacent structures. This is especially true for the retromaxillary, pterygoid and ethmoidal spaces, the rhinopharynx, the sphenoidal sinus, the clivus and other regions at the base of the skull. With our technique of temporary disarticulation of the maxilla these regions can be reached a lot more easily and no irreparable mutilations are caused.

Technique

Nasotracheal intubation or tracheostomy is used depending on the location of the pathology. Temporary tarsorrhaphy is advocated. The incision extends from the vermilion of the upper lip vertically along the philtral crest of the side to be operated on, around the nose upwards to the inner canthus, preserving it, becoming horizontal then and passing laterally to the outer canthus and curving slightly downwards over the zygomatic process (Fig. 1). A vertical incision is placed in the vestibular sulcus. A palatal flap extending from the retrotuberosity area of the side to be operated on

Summary

A case of angiofibroma of large proportions is presented which was manifest in various regions difficult of access. Using conventional techniques marked mutilation would have been expected. Consequently the technique of temporary disarticulation of the maxilla attached to the cheek with a transfacial access to the retromaxillary area was applied and will be described.

Key-Words

Transfacial access - Retromaxillary tumour - Angiofibroma

to the contralateral bicuspid area is raised. Then the subjacent osseous structures are exposed, including the upper part of the zygoma, the lower half of the orbital rim including the orbital floor but respecting the lacrimal system, the piriform aperture with detachment of the nasal mucosa as far as possible and the alveolar process in the paramedian area. The osteotomies are done in the following order: a vertical cut at the level of the temporo-zygomatic junction, another detaching the frontal process of the zygoma, then the orbital walls behind the orbital rim, crossing to the highest point of the piriform aperture again preserving the lacrimal system (Fig. 2). On the orbital floor the infraorbital nerve has been identified and marked, because it has to be sectioned. A vertical incision is then placed in the alveolus between central and lateral incisor which is continued sagittally on the palate to the posterior edge. The palatine artery is freed from its bony channel using a chisel. This way the arterial pedicle of the palatal flap is conserved. Finally the pterygo-maxillary junction is cut with the chisel inserted medially (Fig. 3) the maxilla is now mobilized, remaining pedicled on the cheek and rotating around the osteotomy in the zygomatic arch (Fig. 4).

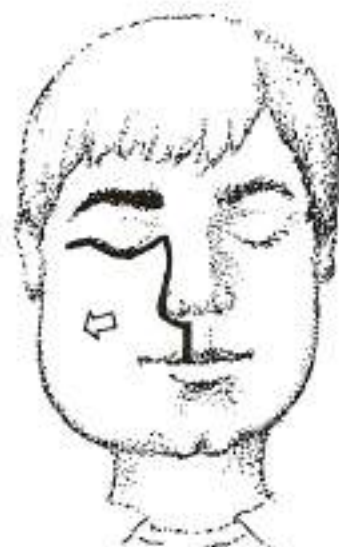


Fig. 1 Incision for unilateral approach.

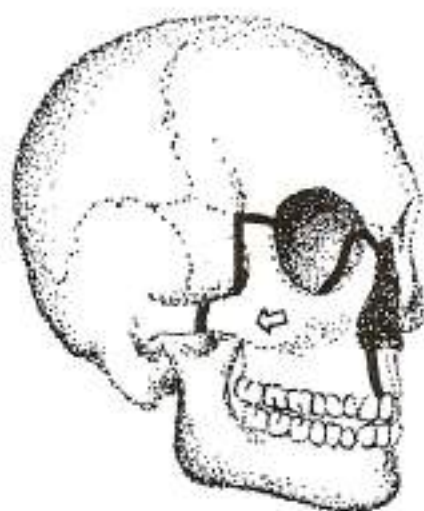


Fig. 2 Osteotomy of the maxillo-zygomatic bloc.

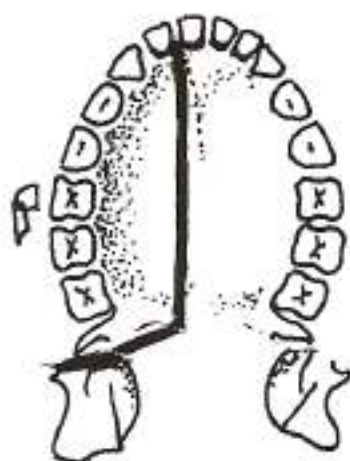


Fig. 3a Osteotomy of the palatal shelf.



Fig. 3b Mobilization of the maxilla.

Fig. 3 Palatal approach.

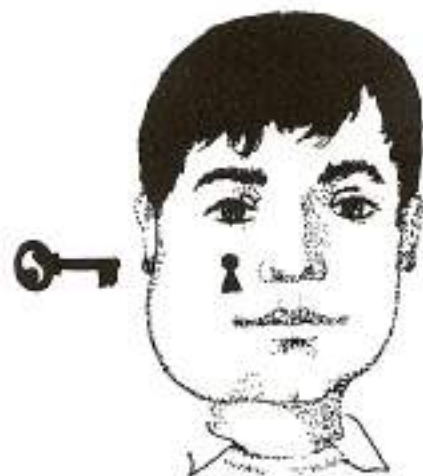


Fig. 4a



Fig. 4b



Fig. 4c

Fig. 4a, b, c The retromaxillary and pharyngeal spaces have to be opened.

The mobilized bloc is protected and fixed by moistened gauze.

In this way easy access is obtained to the pterygomandibular and retromaxillary areas, the rhinopharynx, the nasal fossa, the sphenoid sinus, the ethmoids, the suborbital and subtemporal regions. It is also easy to reach the base of the skull in the area of the foramina and fissures through which the important vessels and nerves pass.

Case Report

In the following a case of enormous juvenile angiofibroma of the post nasal space will be presented, which due to its large dimensions had to be operated on by this technique in order to prevent severe mutilation.

A 14 year old male presented with a history of only minor epistaxis on the right side which was treated twice by the ENT specialist by means of cauterization. He was then sent to the Dept. of Oral and Maxillo-facial Surgery by his stomatologist because of a swelling in the right parotidomasseteric area and recurrent inflammation developing over the last five months and becoming more and more frequent.

On examination an increased volume of the right parotidomasseteric and angle region was noted, the function of the parotid gland could not be evaluated (Fig. 5a). Submandibular lymph nodes were present. On nasal inspection the problem quickly became apparent: there was practically total obstruction of both nasal cavities, more par-



Fig. 5 a

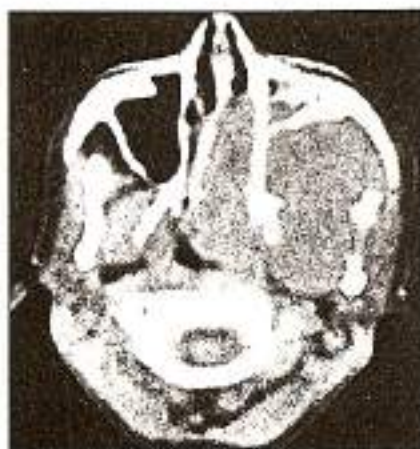


Fig. 5 b



Fig. 6 The maxilla is mobilized and remains pedicled on the cheek. The tumour is exposed.

Fig. 5 a, b Preoperative appearance.

ticularly on the right side. However, the patient could still breathe a little through the nose intermittently. There was difficulty in chewing, ulceration of the soft tissues of the cheek, which caused pain and progressive trismus was seen. The mass in the postnasal space and nasal cavity was not uniform in appearance probably due to the inflammatory process.

Panoramic X-ray study was not conclusive except that a radio-opacity at the maxillary level was seen and that the dento-alveolar structures were intact. The tomographic study also showed extensive radiopacity with loss of transparency of the sphenoidal sinus and the right ethmoid, the maxillary sinus, the nasal cavity and the postnasal space. Facial thermography showed a gradient of 1.5 degrees more on the affected side compared with the left side and an increase in the vascular network. It was the CT scanner (Avellaneda 1979, Legent et al. 1981) which demonstrated the true size and situation of the tumour. The mass occupied the pterygo- and retro-maxillary regions, the zygoma, the nasal cavities, the ethmoids, the floor of the orbit, the post nasal space, the rhinopharynx, the sphenoidal sinus, the jugular, parotid and temporal regions. The nasal septum was pushed to the left (Fig. 5 b). The arteriographic study (Seldinger 1953) of the right internal and external carotids gave the following information: tumour vascularized by the transverse facial, ascending palatine and internal maxillary arteries. Further vascularization was found arising from the ophthalmic artery and intracavernous branches. All in all, the tumour was highly vascularized.

At the beginning, the diagnosis was not easy to make. First of all because an ENT specialist had examined the nasal cavity a few days earlier without suspecting any kind of tumour and secondly because the pathology was more apparent in the cheek and temporal areas. Biopsies were first taken from the cheek and temporal region, which made us suspect a vascular process. The progressive nasal obstruction and the radiographic appearances led to a biopsy in the post nasal space which resulted in the pathologists' reports of angiofibroma.

With this diagnosis, hormonal preoperative treatment

under the guidance of the endocrinologist was commenced and testosterone was administered for two weeks. No remission was noted. On the contrary the clinical appearance became even more dramatic.

Given the connections of the tumour with both the external and internal carotids on the right side, the possibility of arterial embolization was discussed with the Neurosurgical Department. Although this preoperative measure is recommended (Berkstein et al. 1981) it was not accepted because of the risks involved and the little technical benefit which would probably be achieved.

With no other options remaining the Dept. of Oral and Maxillo-facial Surgery decided to operate. Twelve units of blood were made available before commencement of the operation. The procedure started with oral intubation followed by tracheostomy. Then the control of the right common carotid artery as well as internal and external carotids separately was carried out (Riche et al. 1980). Next the mobilization of the maxilla was performed as described (Fig. 6). When the maxilla was turned back it could be seen that the tumour was easily distinguishable from the rest of the structures. It had a firm consistency and rested in a typical teat-shape, around, above, in and among the retro-maxillary, pterygomaxillary and ethmoidal regions, the post nasal space, the sphenoidal sinus, the right nasal cavity, the rhinopharynx, the floor of the orbit, the temporal region, the pterygomandibular and premaseteric regions. The tumour was easily separated from the adjacent structures although in some areas it was attached quite firmly, especially in the rhinopharynx and the choanal space. Eventually it had a bloodless weight of 150 grammes. Inspection showed that the tumour was completely removed. Since the sphenoidal sinus was opened it was curetted, also removing some fragments (Piquet et al. 1979). A moderate haemorrhage occurred only in the pterygomaxillary region, this was easily controlled by local means.

The reconstruction included packing of the sphenoidal sinus, right nasal cavity and maxillary sinus, re-suturing of the infraorbital nerve at the time the maxilla was repositioned and fixed with osteosynthesis wires. Then an



Fig. 7a Full face.



Fig. 7b Profile

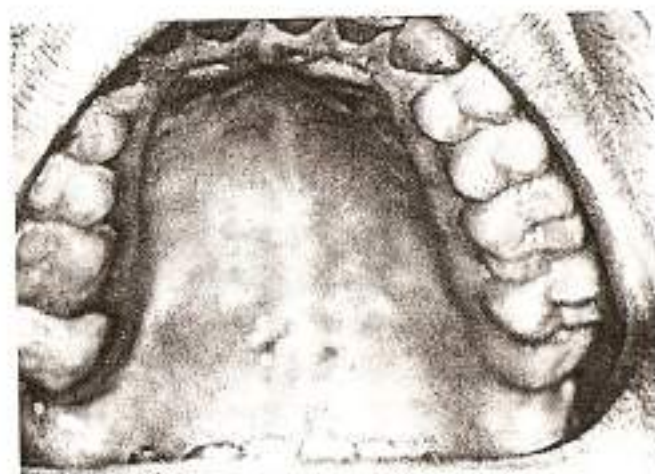


Fig. 7c Intraoral appearance

Fig. 7 Postoperative appearance.



Fig. 7d Computed tomography

intermaxillary splint was placed and the soft tissues were sutured.

Postoperatively the patient was sent to the ICU. He developed atelectasis in the left lung which was treated in a conventional manner. Tracheostomy and feeding by a nasogastric tube were continued for 10 days. During this time the packs were removed. Intermaxillary fixation was maintained for six weeks.

The histological report confirmed the diagnosis of angiofibroma with no signs of malignancy. The postoperative X-ray follow up as well as clinical observation did not produce any significant information. There were no signs of disturbed healing and/or recurrence of the tumour. Function and aesthetics are satisfactory, only a degree of ectropion of the lower eye-lid is visible. Postoperative thermography showed equal temperatures of both halves of the face (Fig. 7).

Discussion

The case presented forced the author to consider a transfacial access to the retromaxillary region (Hernandez Altamir 1982, 1983). It rose from a fundamental need not only to obtain an appropriate operating field but to cause as little mutilation as possible. The technique developed has various advantages.

The incision does not sacrifice any structure which is practically not recoverable and is not important from the functional or aesthetic points of view.

In contrast to transmaxillary techniques which resect parts of the maxilla, no dental structures are sacrificed, there is no risk of necrosis of the maxilla and no second stage reconstruction is necessary. Excellent access is achieved to all the fore-mentioned areas which, without this technique, would not be possible without mutilation except if highly



Fig. 8 Incision for bilateral approach

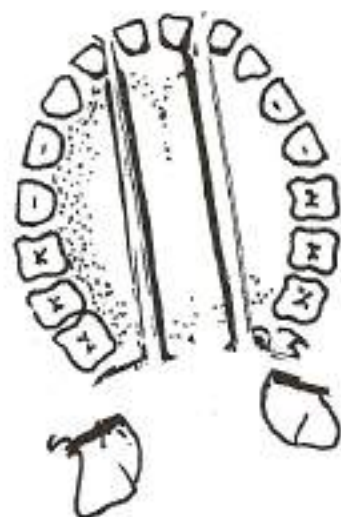


Fig. 9a Osteotomy

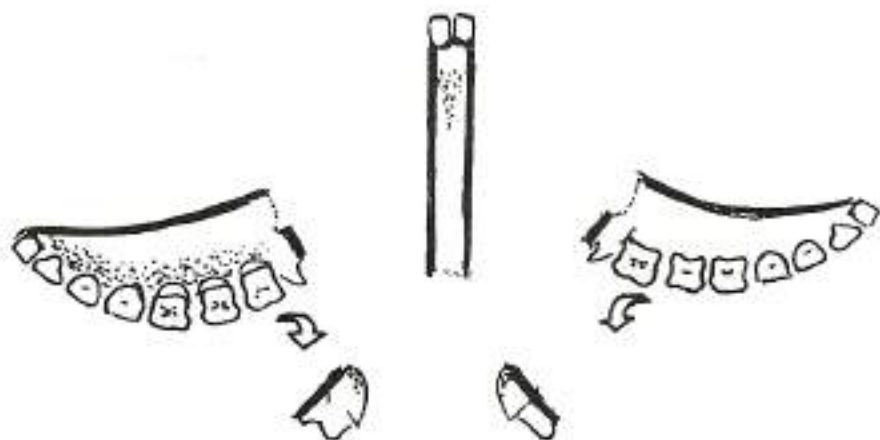


Fig. 9b Mobilization of both maxillary halves.

Fig. 9 Bilateral palatal approach

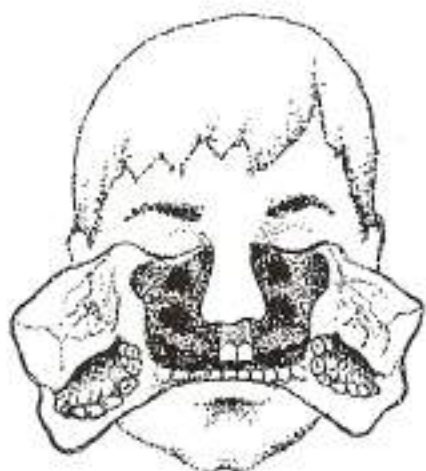


Fig. 10 The face is opened bilaterally, leaving a median strut.

sophisticated and complex techniques such as microsurgery were used, which even then often result in operating fields of limited access and difficult manipulation (Martinez Asenjo et al. 1975, Alfranca Bouthelier et al. 1977, Prades and Bosch 1977, Gobbo 1979). With our technique even the foramina and fissures of the base of the skull are easily accessible. The easy display of the regions referred to above gives a greater guarantee of complete removal of tumours and reduces considerably the risk of serious haemorrhage (García Soto et al. 1979, Altamar Rios 1980, Bey et al. 1981). This is further improved by the fact that the tumour can be removed en bloc without dividing it. Another important aspect is that this technique can be carried out simultaneously on both halves of the maxilla, opening the face like a book (Fig. 8-10). However, the need for such an extensive approach will be extremely rare. The vasculariza-

tion of the pedicle on which the maxilla is based is mainly secured by the facial and transverse facial arteries. As explained we try to respect the arterial pedicle of the palatal flap. Our experience shows however that it could be sacrificed without any great risk.

Ligature of the external carotid artery has not influenced the vitality of our flap in any tangible way. The next time we will consider exclusive temporary arterial control without ligature. Also, since the operation is carried out under direct vision, perhaps it is not even necessary to control the large arteries prior to exposure and removal of such tumours.

From our first case we learned that we should leave the tarsorrhaphy in place for some time in order to prevent ectropion.

There is no doubt that different modifications of our techni-

que will be introduced (Curioni et al. 1984, Martínez-Lage et al. 1984). We expect that this will lead to a new surgical concept which could be used not only in tumour surgery but also in facial osteotomies.

This surgical technique does not try to replace the traditional one in any way. The author only hopes that the surgeon will remember it for selected cases in which the exaggerated size of the tumour and/or its location makes it difficult or impossible to reach it in the traditional way, without mutilation (Oliveras and Mexia 1976, Sierra and Vázquez 1980). It is a good alternative to the temporal approach (Obwegeser 1985) for more medially and anteriorly situated tumours.

Conclusion

The technique of temporary mobilization of the maxilla pedicled on the cheek is simple and straightforward. It gives an excellent access to many regions which are difficult to reach and has been very useful in the specific case of an enormous juvenile angiofibroma of the post nasal space. The main advantage lies in the absence of need to sacrifice any maxillary or dental structures and the ease with which any small sequelae which may occur can be dealt with.

Acknowledgement

The author thanks the Anaesthesiology and Intensive Services, with Doctors Temño and P. Pardo, Head, without whose collaboration the Oral and Maxillofacial Surgery would not have achieved the assistance, teaching and investigation-level which I consider it has at the present time. My thanks also to the rest of the Services and personnel of the Institution, without exception.

Collaborators in the clinical case:

Dr. Bandrés, Resident Doctor of the Maxillofacial and Oral Surgery Service at the "Miguel Servet" Hospital in Zaragoza, Dr. Conlés, Clinical Head of the ORL of the Children's Hospital attached to the Miguel Servet Hospital in Zaragoza. (Head Dr. Alba).

Dr. Dehesa, Clinical Head of the Maxillofacial and Oral Surgery Service of the Miguel Servet Hospital in Zaragoza.

Dr. Ferrández, Clinical Head of Endocrinology of the Paediatric Department of the Children's Hospital (Head Dr. Bonet), of Miguel Servet's Hospital.

Dr. Gómez Perán, Assistant Doctor of the Neurosurgery Service of Miguel Servet's Hospital in Zaragoza.

Dr. Martínez Tello, Clinical Head of the Pathological Anatomy Service (Head Dr. García Julián).

Dr. Rived, Assistant Doctor of the Maxillofacial and Oral Surgery Service of Miguel Servet's Hospital in Zaragoza.

Dr. Ucar, Head of the Neurosurgery Service.

Dr. Valero, Clinical Head of Neuroradiology of the Radioelectrology Department (Head Prof. Solsona).

References

- Alfranca Bontbellier, J. M., L. Rubio Morales, N. Gómez Estancona: Abordaje hipofisario de la vía transnasal y transesfenoidal. *Acta Otorrinolaring.* Esp. 28 (1977) 11
- Altamir Riós, J.: Algunas consideraciones sobre el angiofibroma nasofaríngeo juvenil. *Anales ORL Iber-Amer.* 7 (1980) 467

Avellaneda, R.: Tomografía Axial Computarizada en los tumores rinosinusales. *Anales ORL Iber-Amer.* 6 (1979) 49

Berkstein, A., K. Boleaga, I. Kickueot, A. Garibaldi: Tromboembolización percutánea de arterias maxilares internas para control de epistaxis posterior. *Anales ORL Iber-Amer.* 8 (1981) 31

Bey, P., B. Gueddari, L. Mallissard, M. Pervot: Les carcinomes du naso-pharynx. A propos de 42 cas traités entre 1968 et 1977. *Ann. Oto-Laryng.* 98 (1981) 43

Curioni, C., Padula, E., Toscano, P., Masaggia, A.: The maxillo-cheek flap. Presented at 7th Congress EAMFS, Paris, 1984.

García Soto, N., J. M. Montserrat Viladín, D. Cajale Bao, G. J. López Blanco: Angiofibroma nasofaríngeo, fibroma nasofaríngeo juvenil o fibroma sangrante de la pubertad masculina. *Anales ORL Iber-Amer.* 6 (1979) 217

Gobbo, J. F.: Hipofisectomía transesfenoidal. *Anales ORL Iber-Amer.* 6 (1979) 59

Hernández Altamir, F.: Desarticulación temporal pediculada a mejilla del maxilar superior (es) como vía de abordaje - transfacial a las regiones fundamentalmente retromaxilares y para otras indicaciones. (Vía maxilopterigoidea). Una nueva técnica. *Estoma* 3 (1982) 75

Hernández Altamir, F.: Desarticulación temporal pediculada a mejilla del maxilar superior (es) como vía de abordaje transfacial a las regiones fundamentalmente retromaxilares y para otras indicaciones. (Vía maxilopterigoidea) Una nueva técnica. *Rev. Iberoamer. Cirug. Oral y Maxilof.* 5 (1983) 81

Legend, F., C. Beauvillain, A. de Kersaint-Gilly, G. Leroy, A. Rousseau: Fosse ptérygo-maxillaire (fossa infra-temporalis). Division topographique. Moyens d'exploration. Abord transmandibulaire de la région des ptérygoïdiens. *Ann. Oto-Laryng.* 98 (1981) 435

Martínez Asensio, R., A. Pfluger, C. Suárez: Técnicas quirúrgicas en el angiofibroma de cavum. *Acta Otorrinolaring.* Esp. 3 (1975) 91

Martínez-Lage, J. L., J. Acero, F. Lorenzo: Temporary maxillectomy. Presented at 7th Congress EAMFS, Paris, 1984.

Obwegeser, H. L.: Temporal approach of the TMJ, the orbit and the retromaxillary-infracranial region. *Head and Neck Surg.* 7 (1985) 185

Oliveras, J., M. Mexia: Cirugía de la fosa pterigomaxilar. *Acta Otorrinolaring.* Esp. 27 (1976) 35

Piquet, J.-J., A. Desaulty, M. T. Boschi-Laot, G. Decroix: Le fibrome naso-pharyngien. *Ann. Oto-Laryng.* 96 (1979) 141

Prades, J., J. Bosch: Nueva vía de abordaje quirúrgico de la fosa pterigomaxilar. *Anales ORL Iber-Amer.* 4 (1977) 165

Riche, M.-C., E. Hadjean, J.-F. Tricot, C. Henriquez, J. J. Merlund: Les risques de la ligature de la carotide externe dans le traitement des angiodyplasies cervico-faciales. Plaidoyer pour leur abandon et solutions radiochirurgicales actuelles. A propos de 13 cas de ligature parmi 200 angiomes explorés. *Ann. Oto-Laryng.* 97 (1980) 3

Seldinger, S. I.: Catheter replacement of the needle in percutaneous arteriography, a new technique. *Acta Radiol.* 39 (1953) 368

Sierra, J., C. Vázquez: Cirugía y abordaje del cavum faríngeo. *Acta Otorrinolaring.* Esp. 31 (1980) 549

Dr. Francisco Hernández Altamir, M.D.
Stomatologist
Oral and Maxillofacial Surgeon
Head of the Maxillofacial and Oral Surgery Service
"Miguel Servet" Hospital, Zaragoza, Spain