TRANSFACIAL ACCES TO THE RETROMAXILLARY AREA AND SOME TECINICAL MODIFICATIONS

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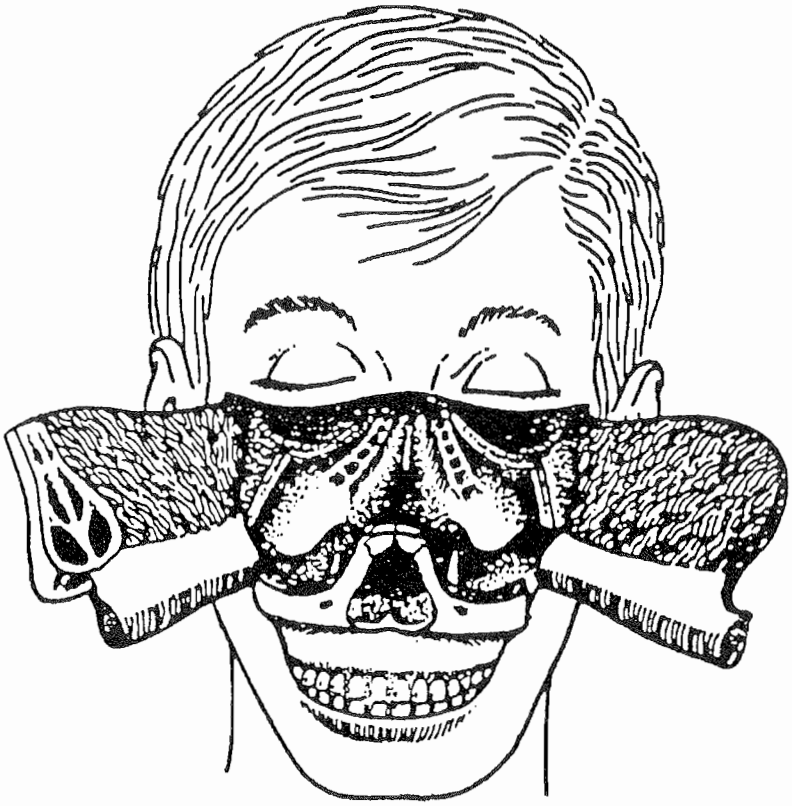

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TITULO: TRANSFACIAL ACCES TO THE RETROMAXILLARY AREA
AND SOME TECHNICAL MODIFICATIONS

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Transfacial Access to the Retromaxillary Area

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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

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 tarsorrhapy 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 to the contralateral biscuspid 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 pedical 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).

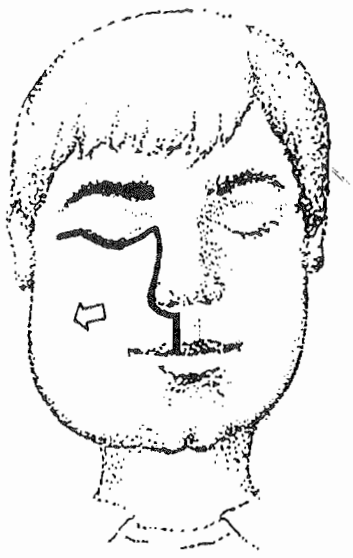

Fig. 1 Incision for unilateral epproach.

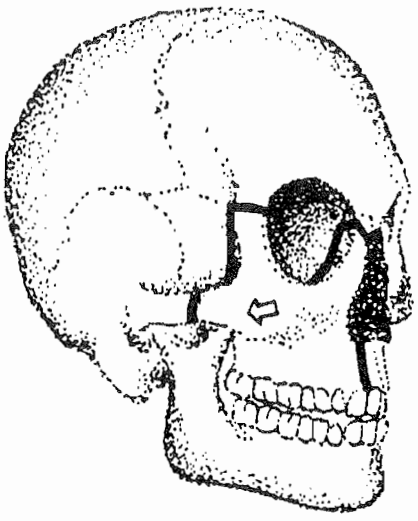

Fig. 2 Osteotomy of the maxillo-zygomatic bloc.

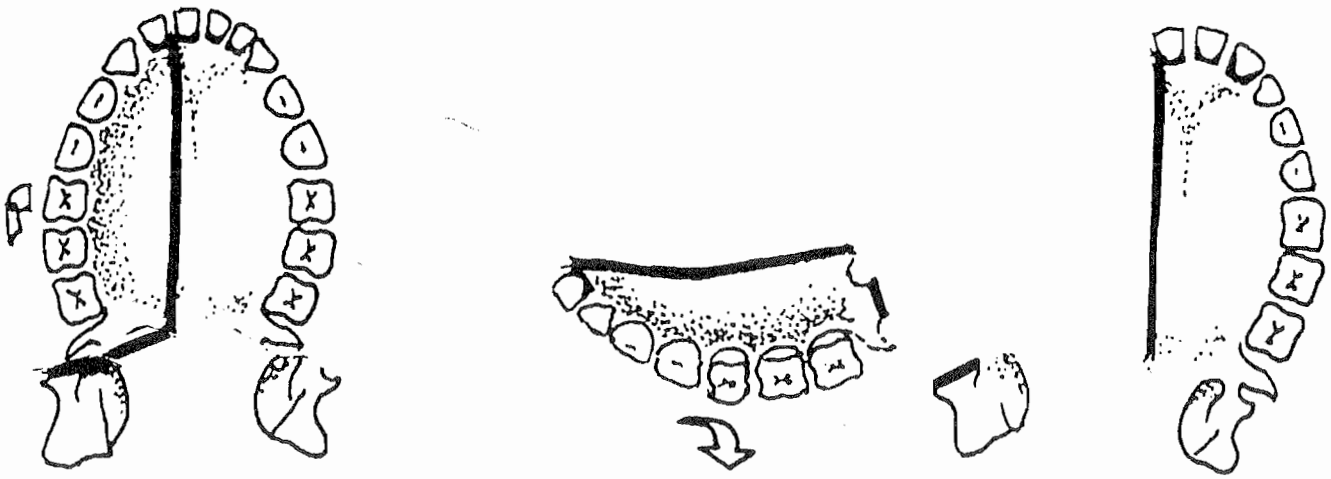

Fig. 3a Osteotomy of the palatal shelf.

Fig. 3b Mobilization of the maxilla.

Fig. 3 Palatal approach.

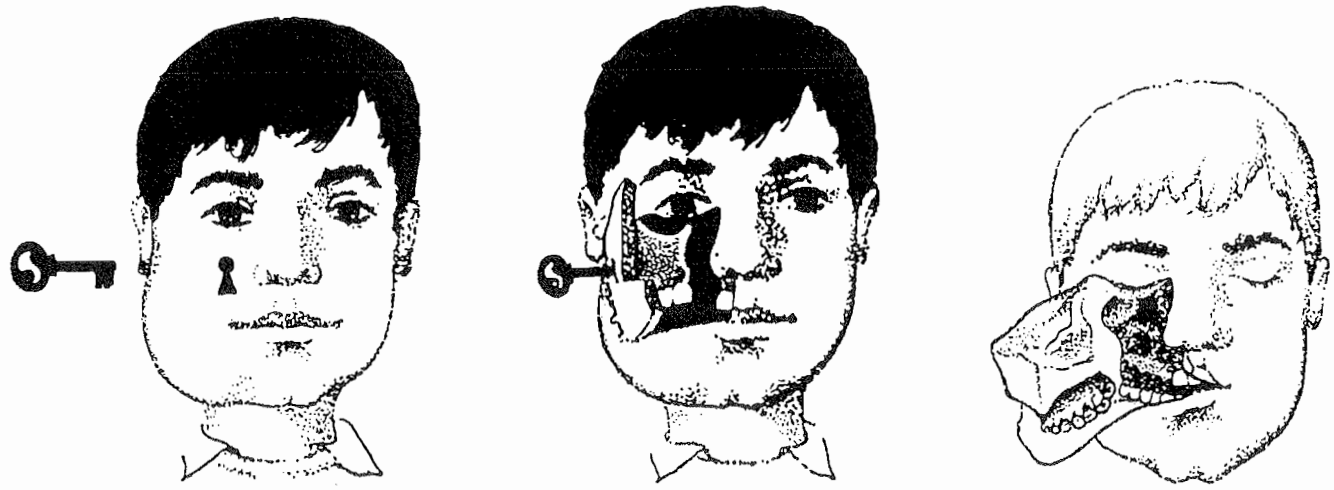

Fig. 4a

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 parotideomasseteric area and recurrent inflamation 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. 5 a). Submandibular lymph nodes were present. On nasal inspection the problem quickly became apparent: there was practically total obstruction of both nasal cavities, more par-

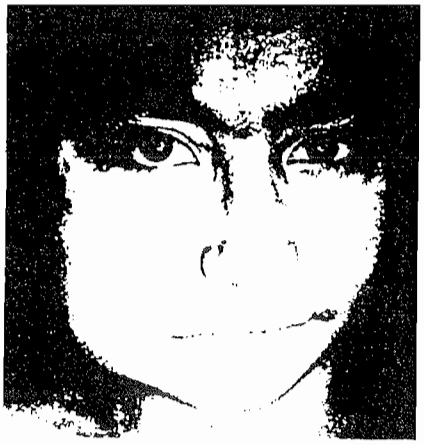

Fig. 5 a

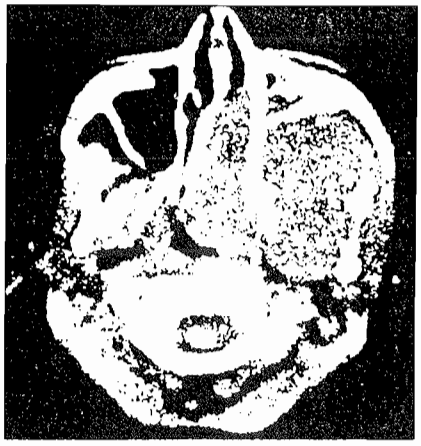

Fig. 5 b

Fig. 5 a, b Preoperative appearance.

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

ticularly on the right side. However, the patient could still breath 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 testoviron 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 premasseteric 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 osteosynthetisis wires. Then an

Fig. 7a Full face

Fig. 7b Profile

Fig. 7c Intraoral appearance

Fig. 7d Computed tomography

Fig. 7 Postoperative appearance.

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 Altemir* 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

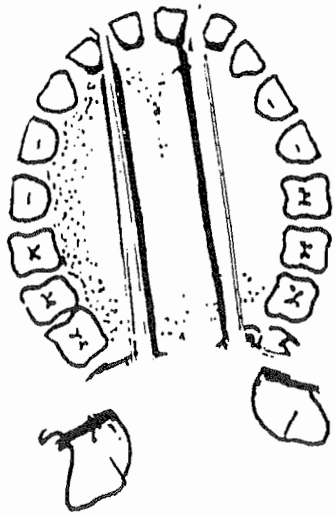

Fig. 9a Osteotomy

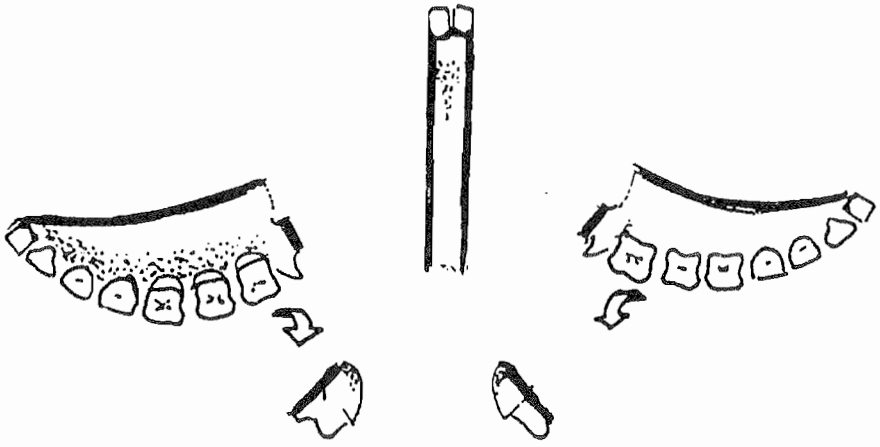

Fig. 9b Mobilization of both maxillary halves.

Fig. 9 Bilateral palatal approach

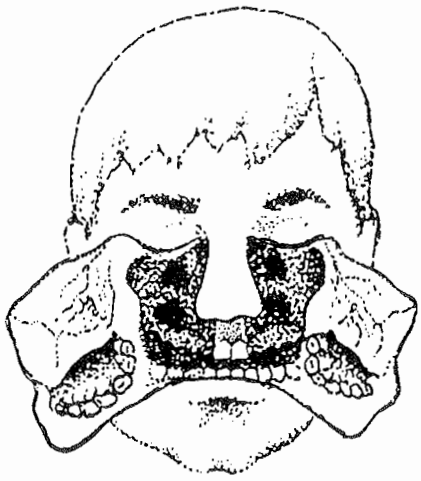

Fig. 10 The face is opened bilaterally, leaving a median strut.

sophisticated and complex techniques such as microsurgery were used, which even then often result in operating fields of limited access and difficult manipulation (*Martinez Asensio* 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 (*Garcia 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 vascularization 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 tarsorraphy 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, *Martinez-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 sequellae which may occur can be dealt with.

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The author thanks the Anaesthesiology and Intensive Services, with Doctors Temiño and F. Pardo, Head, without whose collaboration the Oral and Maxillofacial Surgery would not have achieved the assistence, 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:

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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 Perún, Assistant Doctor of the Neurosurgery Service of Miguel Servet's Hospital in Zaragoza.

Dr. Martinez 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).

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Factors Influencing Parathyroid Allotransplantation in Rats

Michael Friedman (Univ. of Illinois at Chicago)

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Parathyroid transplantation could be a solution to the problem of permanent hypoparathyroidism or hypocalcemia, but immune rejection has caused allograft failures. Parathyroid tissue is not immunologically privileged. An attempt was made to create a predictable model of parathyroid allotransplantation using newborn and fetal tissue without immunosuppression of the host. Studies, done in rats, were based on the successful use of cyclosporine in renal and cardiac transplantation. Cyclosporine was given orogastrically in a dose of 20 mg/kg daily. Some animals received long-term immunosuppression after implantation of fetal thyroparathyroid complexes.

Maintenance of a serum calcium level above 8 mg daily was taken as biochemical evidence of graft function. The return of pregraft hypocalcemia after excision of the graft site also indicated successful function, as did histologic evidence of normal parathyroid tissue at the graft site. The serum calcium level rose transiently after allografting from newborn rats and after fetal parathyroid allografting. A 1-week course of cyclosporine was associated with a more rapid and persistent rise in the serum calcium level; levels remained elevated for 2 weeks after cessation of cyclosporine therapy. Long-term graft survival was achieved in animals given cyclosporine continuously for 40–90 days after fetal parathyroid allografting.

The ability of a fetal parathyroid allotransplant to suppress specific T cell activity and survive in a potentially hostile setting is enhanced by cyclosporine therapy. The agent is not yet ready, however, for wide clinical use.

▶ This article is the outstanding candidate's thesis by Friedman that was the recipient of this year's Fowler Award. It deals with the effort to transplant parathyroid gland tissue into a histoincompatible host without systemic immunosuppression.

Previous reports in this field have been confusing and contradictory. There have been numerous reports of failure on the basis of immunologic rejection and occasional reports of success (probably because of random and rare instances of histocompatibility). Some authors reported that either adult or fetal parathyroid tissue is immunologically "privileged." Others described wide differences in survival based on the anatomical site of surgical implantation.

Although not providing a definitive set of answers to these complex questions, this work has given us important new information that should be helpful in the progress toward resolution of this problem. Cyclosporine or one of its pharmacologic descendants would seem to be required as a long-term immunosuppressant for sustaining viable and functional parathyroid allografts.—B.J. Bailey, M.D.

Transfacial Access to the Retromaxillary Area

Francisco Hernandez Altemir (Hospital "Miguel Servet," Zaragoza, Spain)
J. Maxillofac. Surg. 14:165–170, June 1986 8–9

Temporary disarticulation of the maxilla via a transfacial approach can provide access to the retromaxillary, pterygoid, and ethmoidal spaces, as well as the rhinopharynx, the sphenoid sinus, and the clivus, without mutilating surgery.

TECHNIQUE.—The incision extends from the upper lip around the nose to the inner canthus and continues horizontally to the outer canthus and over the zygomatic process. A vertical incision is made in the vestibular sulcus, and a palatal flap is raised to expose the osseous structures. Osteotomies are done vertically first at the temporozygomatic junction, then to detach the frontal process of the zygoma, and then along the orbital walls behind the orbital rim, crossing to the peak of the piriform aperture, thus preserving the lacrimal system. A vertical incision is then made in the alveolus. The pterygomaxillary junction is cut and the maxilla mobilized while remaining pedicled on the cheek.

This approach does not sacrifice any important structure that is not recoverable. No dental structures are lost, and no second-stage reconstruction is necessary. The foramina and fissures of the skull base are readily accessible. The technique may be used simultaneously on both halves of the maxilla. Ligation of the external carotid artery has not compromised flap vitality, but temporary arterial control without ligation is a possibility.

This approach is useful in selected patients when the size and/or location of a tumor makes it difficult or impossible to reach by a conventional approach without mutilation. Functionally important maxillary and dental structures are preserved.

▶ Although this article from Spain is only a case report, it describes an important, innovative approach to an extremely difficult surgical access problem. The retromaxillary region, sphenoid sinus, nasopharynx, clivus, and base of the skull can be reached by temporary mobilization of the maxilla pedicled on a cheek flap with its major blood supply.

Hernandez Altemir reported this work in Europe in 1982, and it has taken 4 years to reach the English language literature. Whereas the technique is likely to have limited usefulness in the practice of most otolaryngologists, it is an innovation that may prove to be of great importance in a small number of situations. The beauty of this approach is that it preserves important skeletal, dental, and sinus structures while providing wider exposure of and improved access to the region of surgical interest.—B.J. Bailey, M.D.

Craniofacial Resection for Tumors of the Nasal Cavity and Paranasal Sinuses

Anthony D. Cheesman, Valerie J. Lund, and David J. Howard (Royal Natl. Throat, Nose and Ear Hosp., Charing Cross Hosp., and Inst. of Laryngology and Otology, London)
Head Neck Surg. 8:429–435, July–August 1986 8–10

TECHNIQUES IN

AESTHETIC CRANIOFACIAL SURGERY

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AESTHETIC CRANIOFACIAL SURGERY

KENNETH E. SALYER

FOREWORDS BY DANIEL MARCHAC AND FERNANDO ORTIZ MONASTERIO

FACIAL APPROACH

Access to the retromaxillary area, as described by Hernandez-Altemir, can be obtained with modifications as needed. In the unilateral facial approach, external skin incisions are necessary around the nose on the contralateral side, over the dorsum, and below the eyelid, hinging open the maxilla on its soft tissue attachment. The vertical incision of the vestibular mucosa must not coincide with the palatine alveolus osteotomy.

The osteotomies may vary, but most commonly extend through the zygoma, along the edge of the orbital rim, above the medial canthus and through the nasal bone, down through the hinged alveolus between the lateral and central incisor on the side of the initial incision. The incision through the palate begins directly behind the lateral incisor on that side and goes through the pterygomaxillary junction. This allows the entire maxilla to be hinged out on a subcutaneous pedicle (Fig. 1.10).

Such wide exposure of the retromaxillary area offers the opportunity to reach such structures as the base of the cranium, orbit, pterygomaxillary area, nasal area, cavum, clavius, sphenoid sinus, and temporal zygomatic region. This is particularly advantageous in tumor resection as well as in reconstruction of traumatic and certain congenital deformities.

SPLIT LAMELLAR TECHNIQUE

This osteotomy introduces a new technique in which the facial skeleton is split between the internal and external bony lamella. This osteotomy allows a quantifiable translocation of the external table against the native position of the internal table (Fig. 1.11). This interlamellar osteotomy has led to improved aesthetic results in the orthomorphic reconstruction of congenital deformities.

The split orbitofacial osteotomy was developed by us from performing over 400 orbitofacial osteotomies and from technical improvements in surgical equip-

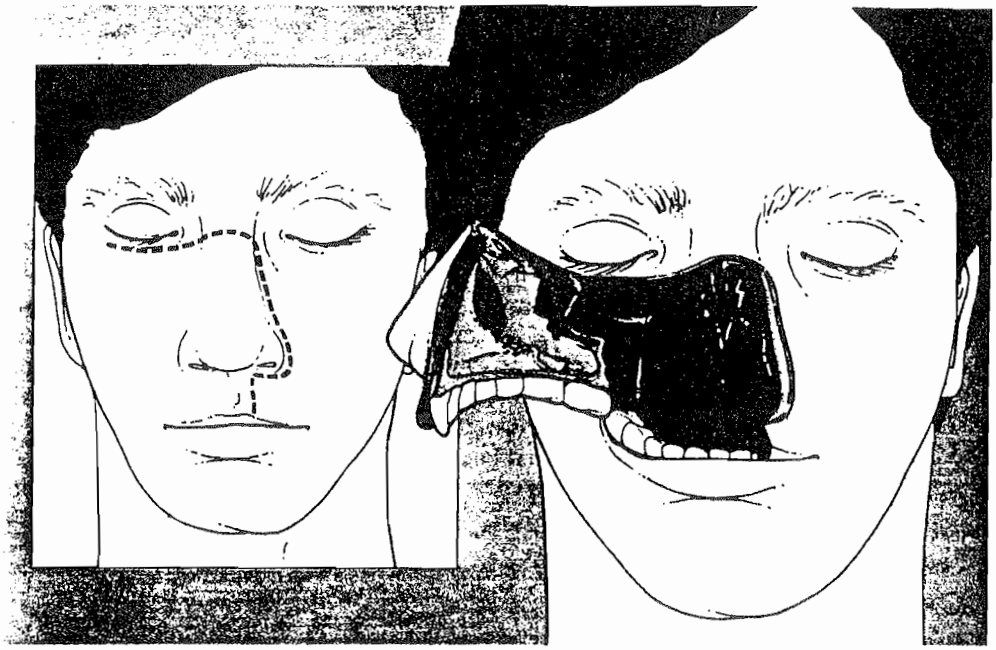

Fig. 1.10 This approach to the retromaxillary region, which was described by Hernandez-Altemir, gives good intrafacial access for tumor resection. The maxilla is hinged open on a pedicle of the facial soft tissues after osteotomies are made as needed, and the palate is incised through to the pterygomaxillary junction.

TRANSFACIAL ACCESS TO THE RETROMAXILLARY AREA

By: Francisco Hernández Altemir, M.D., D.M.D.

ABSTRACT

A new technique on how to reach the retromaxillary area is described and also some modifications which are at the moment being studied and applied. Its aim is to obtain a surgical field which is sufficiently large enough to treat mainly, tumoural processes located in an area, which when exposed have been preceded until now by important mutilations, or else, fields which were so small that no guarantee was offered, in order to be able to erradicate certain kinds of tumours, without risks of haemorrhages or incomplete removals.

INTRODUCTION

The retromaxillary area has always been a challenge for the surgeon, proof of this being the large number of techniques which have been described.

Our surgical experience, in the oral and maxillofacial territory, not only in oncological surgery (8), but also in traumatological techniques (11), of deformities, etc., and without doubt other authors' experience (1,7,15,19 and 20), are what we have been able to base ourselves on to conceive a new technique, which has arisen because of need and which - maybe before having to resolve the first clinical case, was already in our minds.

Widely and directly exposing the retromaxillary area - opens up many possibilities to reach structures in the base of the cranium, of the orbit, the pterygoid maxillary area, nasal area, cavum, clivus, sphenoid sinus, temporal zygomatic region, etc. etc. (9, 10,12).

MATERIAL AND METHOD

We will find out the magnitude of the process to be treated by a meticulous study of the clinical case, by means

of tomographies, scanner and with images of magnetic resonance and even with angiography by digital substraction of images, based of course, on a correct history and detailed clinical exploration, etc. Preoperatory biopsic studies can be contraindicated (3,6).

If mainly cavum angiofibromas are suspected there must be sufficient crossed blood (2,4), although the surgical - field is controlled much better now with our access.

Nasotracheal, submental (13,14) intubation or tracheostomy will be chosen according to the characteristics and location of the tumoural process.

The environment in which we have to carry out the technique will make a trachostomy the most advisable the majority of times.

In hospitals with many facilities, Intensive Care Units, etc. the nasotracheal or submental intubation can give us sufficient guarantees, both in the operation and in the postoperatory surveillance.

If the transfacial access technique is bilateral or in other ways which we describe, the tracheostomy or submental intubation may be indicated. The tracheostomy or submental intubation, both unilateral and bilateral, can only be avoided, if we perform the so-called minor transfacial access - techniques, the orotracheal or contralateral nasotracheal intubation being sufficient in general, as will be understood later on, not wishing to go further into this at the moment.

As a base we are going to give some technical details of what I now call, larger unilateral access technique to the retromaxillary area, which we have experience of. We will set forth the descriptions of the techniques which have been derived from it in an even more schematic way, with some small notes on the drawings.

So, in the description of this greater unilateral technique, the incisions in the skin and mucosas and the osteotomy lines can be seen in a series of drawings which we call BASIC SERIES, and which go from figure 1 to figure 9.

The vertical incision of the vestibular mucosa must not coincide with the palatine alveolus osteotomy line (fig. 5).

The osteotomies of the palatine region are preceded by the lifting of the fibromucosa after incision which follows the neck of the dental pieces in their palatine portion and whose prolongation in the tuberositary areas can be used for osteotomies in the pterygomaxillary regions.

Once the osteotomies have been performed, the luxation of the maxilla is carried out with the instruments already designed, which make the disjunctions easier. The luxation can at times be done manually, although with the help of an instrument to separate the soft parts, such as the nasal fibromucosa, etc.

The suborbitary nerve may make the displacement of the maxilla difficult, having to divide it into sections and mark it, in order to suture it from end to end in the reconstruction.

Depending on the type of tumour or process to be treated, it may be advisable or not to control beforehand the carotid vessels, mainly the external carotid, which can be clamped and after removing the tumour, freed, watching, of course, the operatory bed (18).

In our cases we have thought it advisable to carry out a temporary tarsorrhaphy.

Below, as we have mentioned above, we describe other modifications which are being studied, with their relative denomination and with some small notes at the bottom of the figures, trying, in this way, not to make the text confused.

BASIC SERIES

Greater Unilateral Technique

Generalities:

Figs. 1 to 9.

Greater unilateral technique including internal and external structures

Figs. 10 to 17.

OTHER POSSIBILITIES

Minor unilateral technique

Fig. 18.

Greater bilateral technique

Figs. 19 to 25.

Two pedicle minor bilateral technique

fig. 26.

Greater bilateral technique en block which includes nasoethmoidal and septal structures pedicled to one side.

Figs. 27 to 32.

Minor bilateral technique which includes one pedicle nasoethmoidal and septal structures

Figs. 33 to 38.

Intraoral technique with supraapical, pterygomaxillary and septal osteotomies.

Figs 39 to 43.

Pyramidal technique with the osteotomized block pedicle to the palate.

Figs. 44 to 50

Photograph of the fire enamel which represents the greater unilateral and bilateral technique.

Fig. 51.

DISCUSSION

If the techniques are correctly performed, very favourable cosmetic and functional results are obtained, due mainly to the fact that it is not necessary to sacrifice maxillary, or dental structures, respecting the oseous architecture of the maxillas, because as we have pointed out, the line of the osteotomies permits the directed luxation of the maxilla(s), with which, apart from exploring them, we also separate them from the surgical field, which is going to give - access to the retromaxillary region and adjacent areas. - These in turn can also be extended, so that our surgical progression can let us exceed the pterygomaxillary region, the clivus, etc., and even the clefts and foramens of the base of the cranium, with what all this means.

The wideness of the surgical field, thus obtained, makes it easier to examine the areas and the exeresis of the tumours found on this level. As a result of this, relapses due to incomplete removals are less common, although we do not have enough statistics to affirm this, and we only mention it due to pure logic.

Vascularization of the upper luxated maxilla is sufficient, on being pedicled to the cheek and as this receives great part of the irrigation, through the transverse facial artery.

In the bilateral techniques the face remains open like a book, the central incisors, the nasal septum and the paramedical palatine structures will serve as points of reference for our reconstructing osteosynthesis.

Since we described out technique (9,10), new authors have contributed, as we have already said, modifications, which is quite normal (5,16), or else real new techniques (17), with similar intentions of reaching the retromaxillary areas, etc.

Once more, the oral and maxillofacial surgeon has used the examples which everyday clinical cases offer us to develop his techniques. I refer, mainly, now to the design of

the osteotomies, which often are only a real copy of those which occur accidentally in traumatisms of different kinds.

We wish to point out how the techniques which I have called minor ones, and in general, those that respect the insertion of the palatine fibromucosa, are less traumatic and also let us use the palatine pedicles to design other forms of access to the retromaxillary, ethmoidal, rhinopharynx areas, etc., etc. (12), as can be seen in our series of drawings.

The photograph of the enamel which we show at the end of the text (Fig. 51) serves as a summary of this work, where what has been attempted, more than setting forth a technique, is to point out the philosophy of access to the retromaxillary areas, according to our criteria.

THANKS

To the patients themselves and their relations who, because of their anguish and fears, have forced us to look for less traumatic and safer therapeutic means.

To Ms. María Pilar Gracia Miranda, who accepted our indication to make the enamel, recovering perhaps, an ancient means of publication which can have its charm in an era with publication means as sophisticated as ours.

LEGENDES

BASIC SERIES

Greater Unilateral Technique

Generalities:

Figs. 1 to 9

Fig. 1.- How to reach the pterygomaxillary region.

Fig. 2 and 3.- Entry by opening the upper maxilla
Description of the greater unilateral technique.

Fig. 4.- Cutaneous incision.

Fig. 5.- Incisions in the vestibular and palatine mucosa, at points, detail of the osteotomy line.

Fig. 6.- Most common course and order of the osteotomies 1, 2, 3, 4, 5 and 6.

Fig. 7.- Pterygopalatine osteotomies 5 and 6.

Fig. 8.- Luxated maxilla

Fig. 9.- Final aspect after completing the osteotomies and with maxilla mobilized.

Greater unilateral technique including internal and external structures

Figs. 10 to 17.

Fig. 10.- Cutaneous incisions, the left subpalpebral can be extended along the whole line of dots.

Fig. 11.- Incisions in the vestibular and palatine mucous in thick line. on dots line osteotomies.

Fig. 12.- Osteotomies 1,2,3,4,5 and 6.

Fig. 13.- Right-hand side view of the osteotomies 1,2,3,4,5.

Fig. 14.- Left-hand side view of the osteotomies 4,3',6.

Fig.15 .- The whole of the upper left maxilla has been mobilized and part of the right-hand one.

Fig. 16.- Aspect of the operatory field after performing the mobilization of the maxilla and the nasal structures.

Fig. 17.- The same aspect of fig. 16, only greater decollement of the soft parts of the left side and of the upper left vestibular mucous in the vestibular base.

OTHER POSSIBILITIES

Minor unilateral technique

(It does not include the infrastructure of the hemimaxilla which is pedicled or mobilized).

Fig. 18.- The intermaxilla relation is kept whole!

Greater bilateral technique

Figs. 19 to 25.

Fig. 19.- Cutaneous incisions.

Fig. 20.- Incision in the palatine fibromucosa, which will unstuck.

Figs. 21 and 22.- Osteotomies 1,2,3,4,5,6 and 1′,2′,3′,4′,5′,6′ corresponding to the right and left sides respectively.

Fig. 23.- Pterygomaxillary and palatine osteotomies 5,6 and 5′,6′.

Fig. 24.- The maxillas separated from the pterygoid and paraseptal regions.

Fig. 25.- Final aspect, the face is open like a book!

Two pedicle minor bilateral technique

(It does not include the infrastructure of the maxillas).

- The oseous structures which limit the maxillary sinuses are displaced from one side to another.

Fig. 26.- If necessary the maxillary infrastructures can be luxated or fractures at pterygomaxillary and septal level in this way drop the dental alveolus and palatine portions in bloc, with which the pterygomaxillary area is reached more easily.

Greater bilateral technique en bloc which includes nasoethmoidal and septal structures pedicled to one side.

Figs.- 27 to 32

Fig.27.- Cutaneous incisions

Fig.28.- Incision in the palatine fibromucosa which will be unstuck.

Figs. 29, 30 and 31.- Osteotomies 1,2,3,4,5 and 1′,2′,3′,4′,5′. The disjunction of the ethmoidal and septal structures is obtained with the chisel.

Fig.32 .- Final aspect. The contens of both maxillas and the nasal and ethmoidal structures are contained in the lateral flaps, specifically in the figure, on the right-hand side.

Minor bilateral technique which includes one pedicle nasoethmoidal and septal structures

Figs. 33 to 38

Fig.33.- Cutaneous incisions.

Fig.34.- Incision at the bottom of the vestibular and tuberositary mucosa.

Figs.35, 36 and 37.- Osteotomies 1,2,3,4,5,6 and 1',2',3',4',5',6'. The chisel achieves the disjunction at base of craneum level (4) and in the caudal region with another ad hoc, the causal section of the nasal septum (6).

Fig.38 .- Final aspect, the pterygopalatine region remains fixed to the pterygoid structures (if necessary it can be luxated, with which the surgical field is widened), the advantage being that the palatine fibromucosa does not have to be unstuck, with which the surgical traumatism noticeably decreases.

Intraoral technique with supraapical, pterygomaxillary and septal osteotomies.

Figs. 39 to 43

Fig. 39.- Line of incision at the base of the vestibule and tuberositary regions.

Fig. 40.- Osteotomies 1,2 and 1′.

Figs. 41 and 42 .- Osteotomies 1,2,3 and 1′,3′.

Fig. 43.- Intraoral view of the nasal floor and sinumaxillas,access to the cavum, etc.

Pyramidal technique with the osteotomized block pedicle to the palate

Figs. 44 to 50.

Fig. 44.- Incisions at level of the soft parts of the face.

Fig. 45.- Incision line at base of the vestibule and tuberositary region.

Fig. 46.- Path of the osteotomies.

Fig. 47.- Osteotomies 1,2,3 and 1′,2′. Osteotomies 2, 2′,3 , will change their path (fine dots), if we wish to achieve the result shown in fig. 50.

Figs. 48 and 49 .- Osteotomies 1,2,3,4 and 1′,2′,3′,4′.

Fig. 50.- The block dropped, the ethmoidal, esphenoidal region, cavum and pterygomaxilla area is seen.

Fig. 51 .- Photograph of the fire enamel which represents the greater unilateral and bilateral technique.

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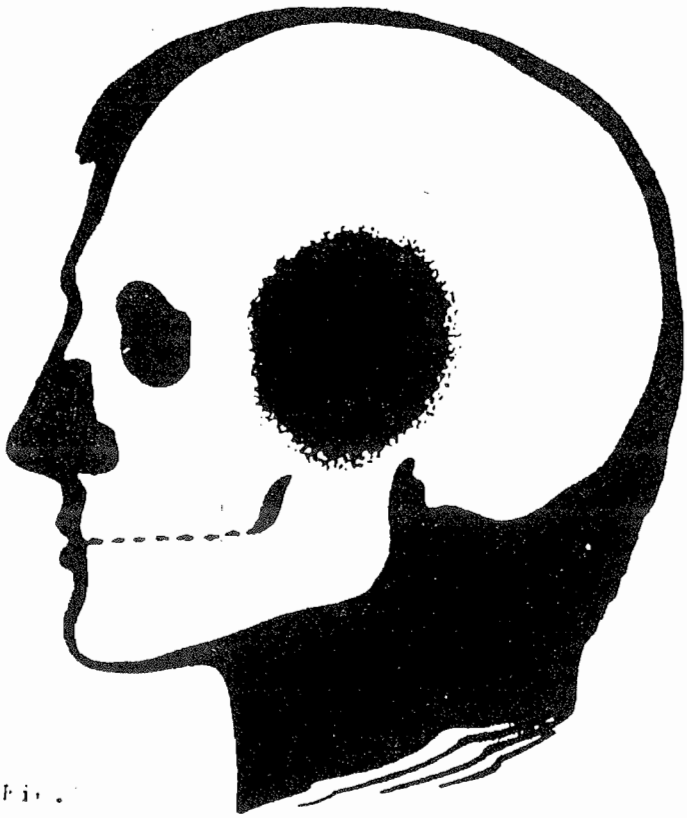

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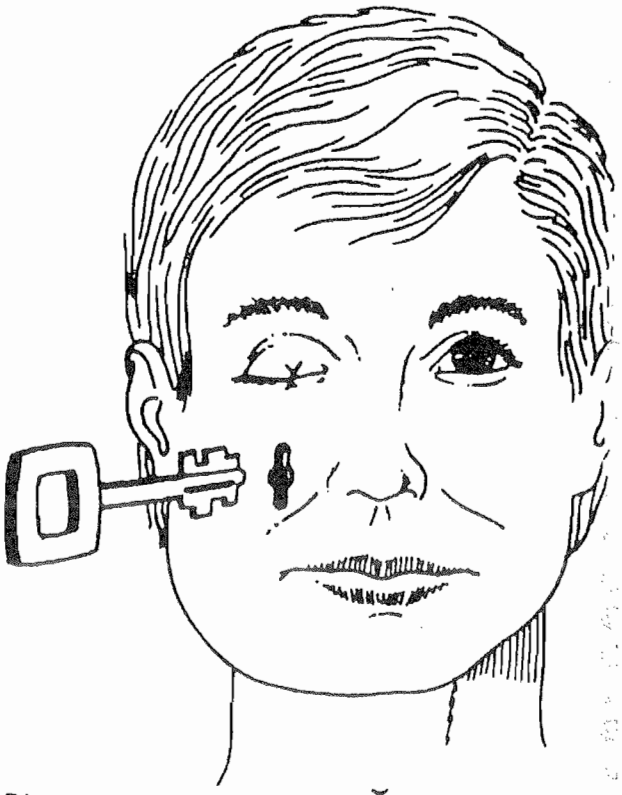

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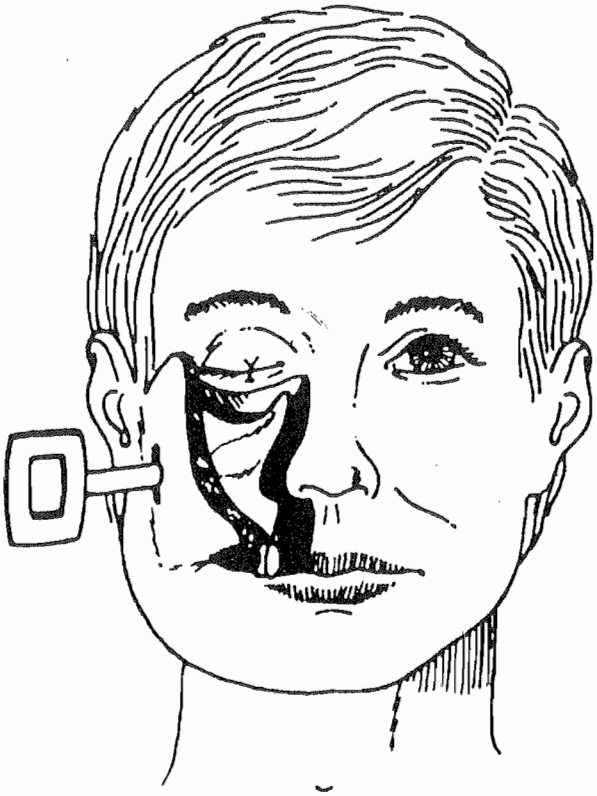

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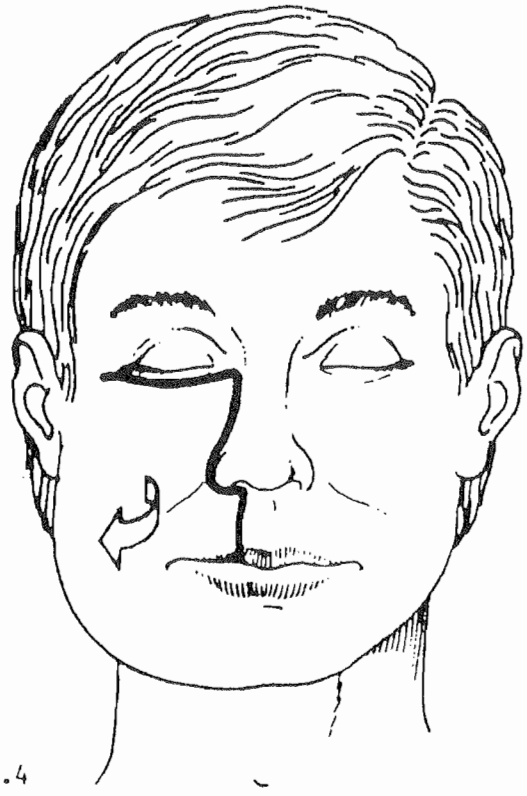

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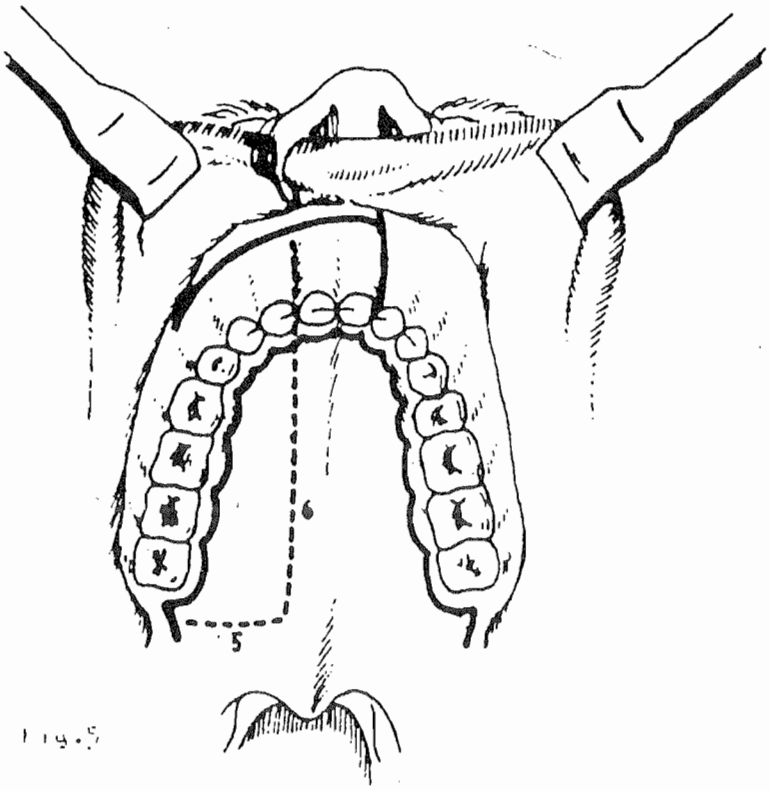

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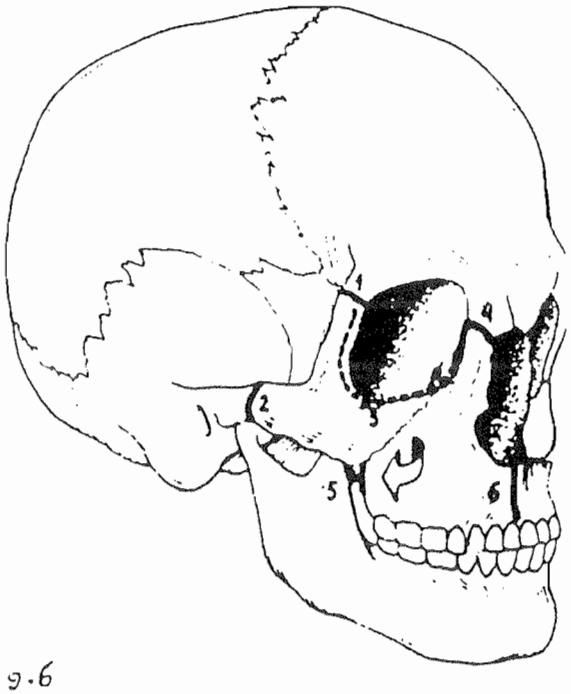

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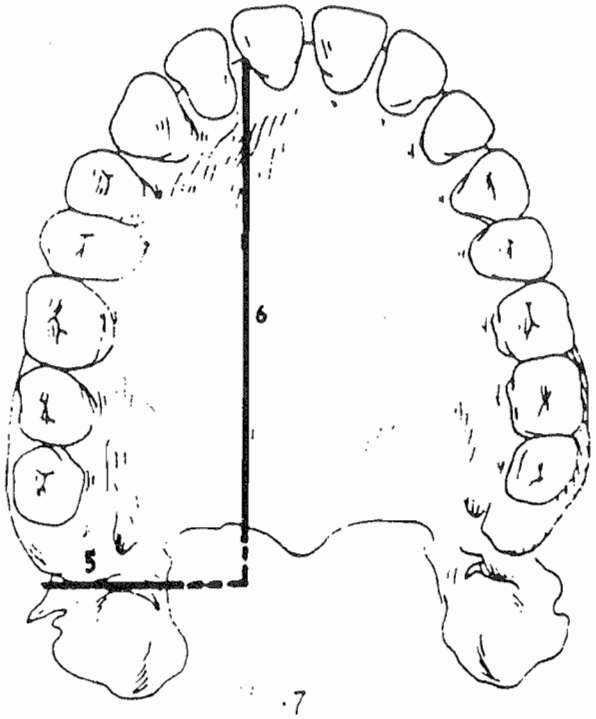

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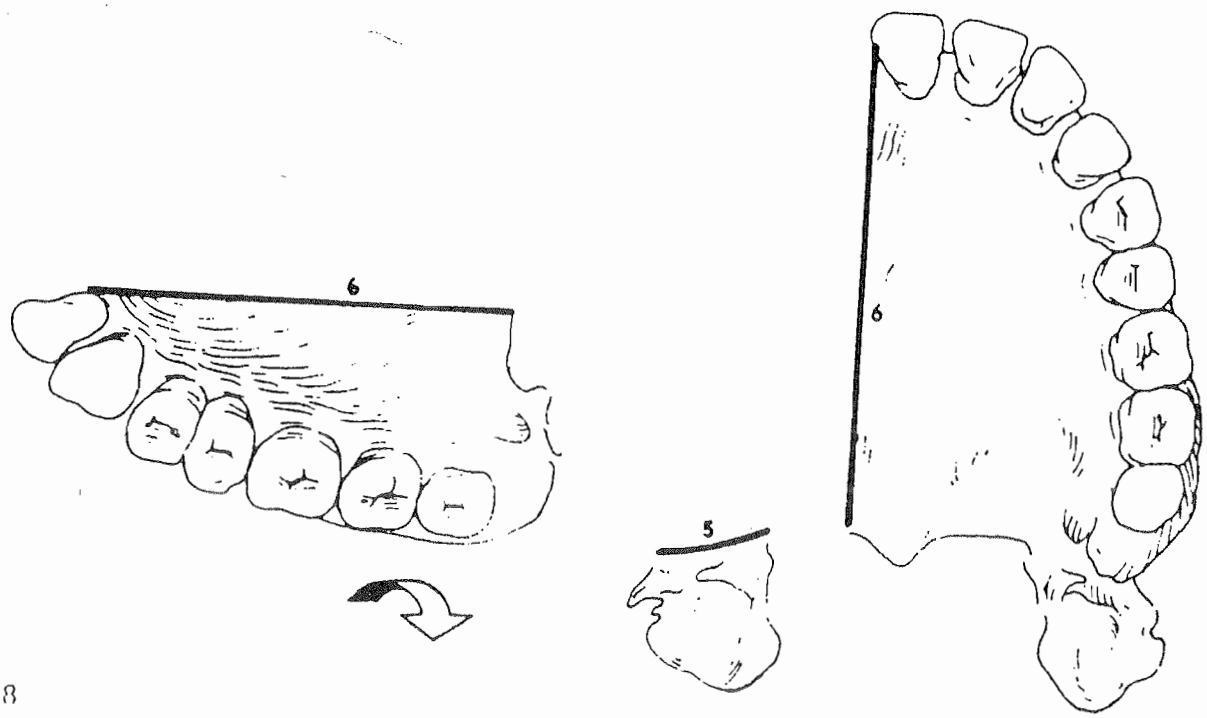

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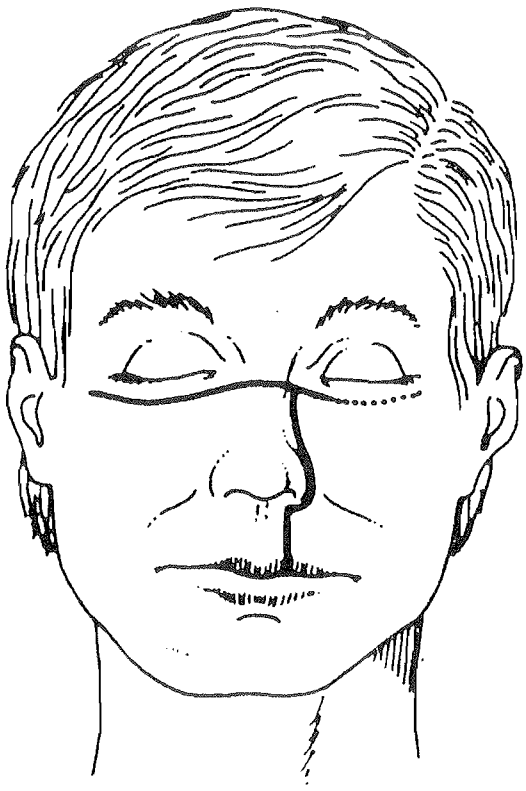
Fig.9



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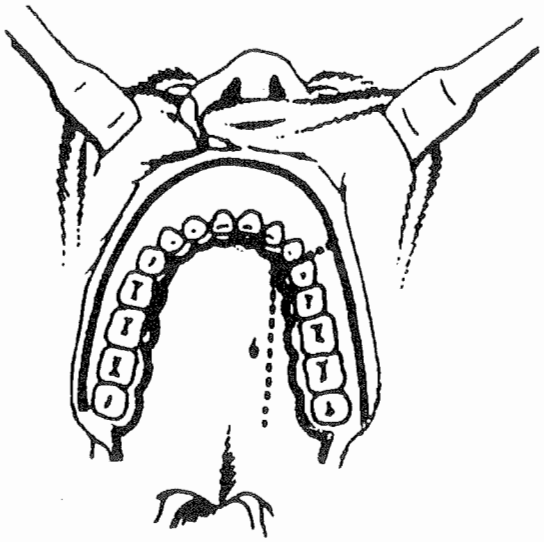

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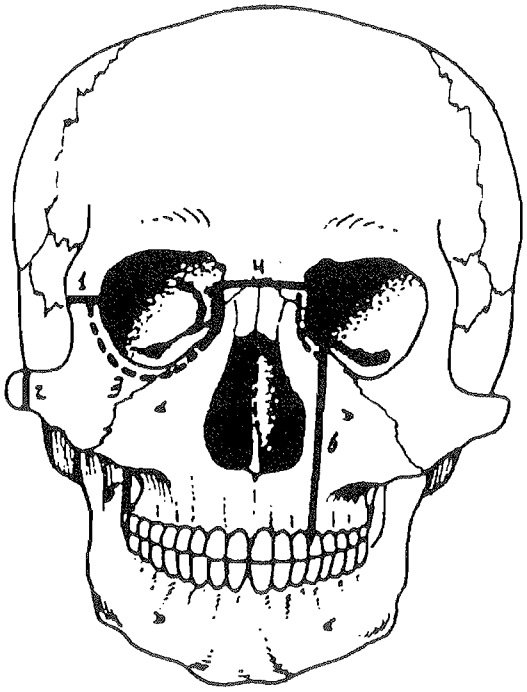

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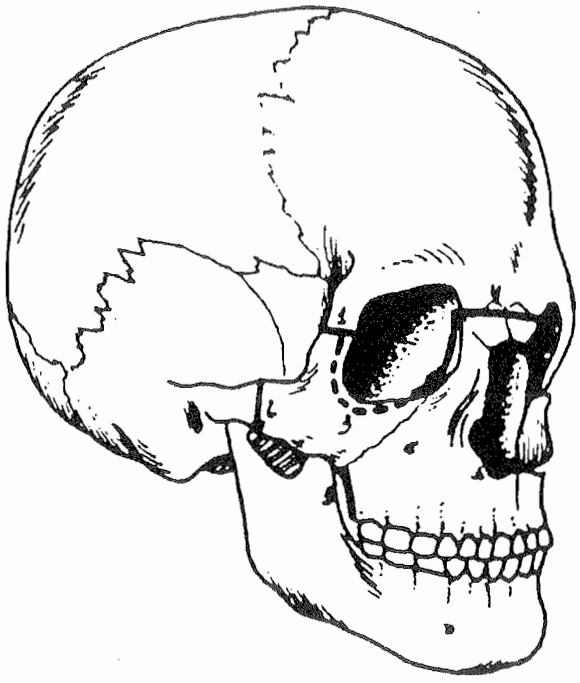

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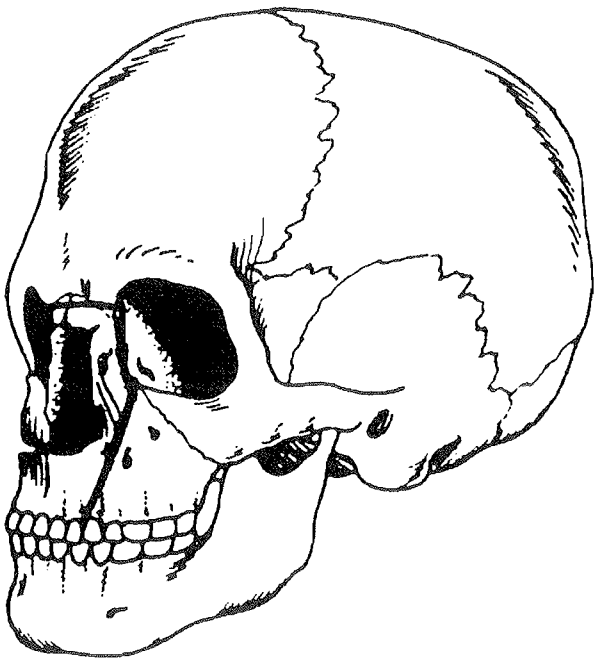

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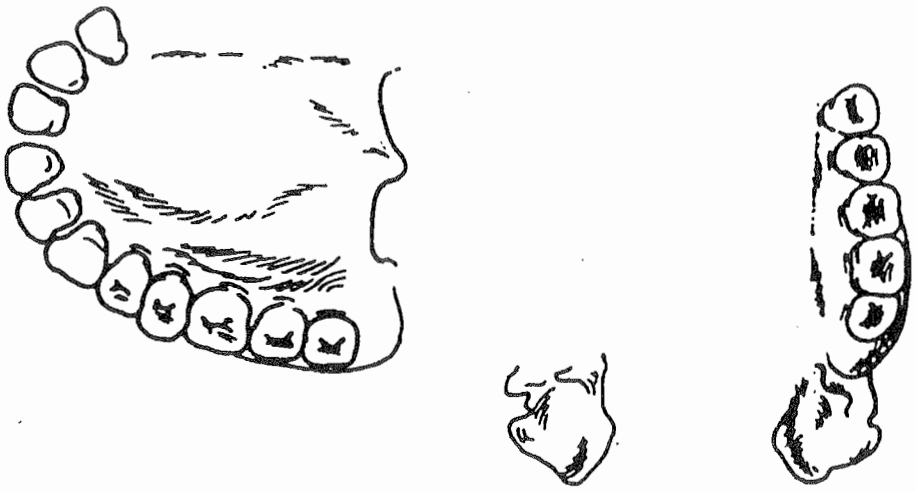

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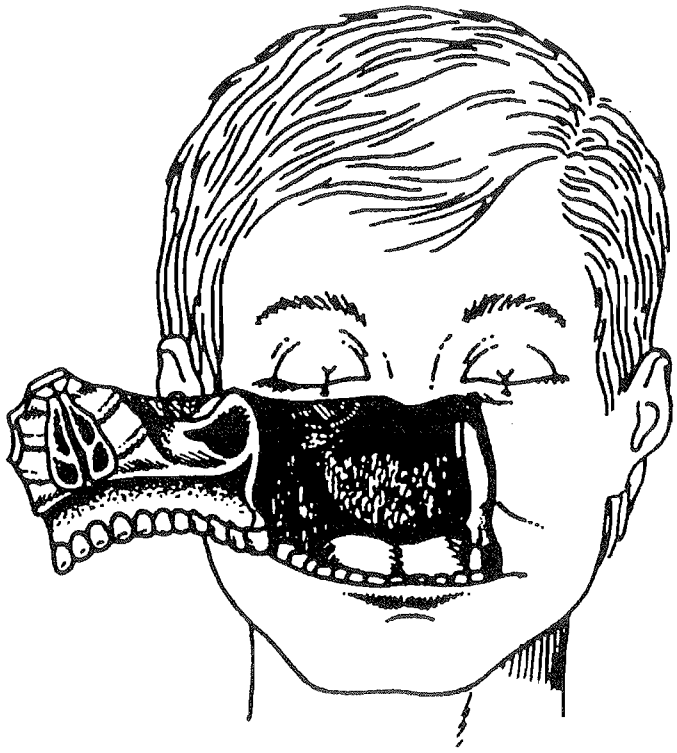

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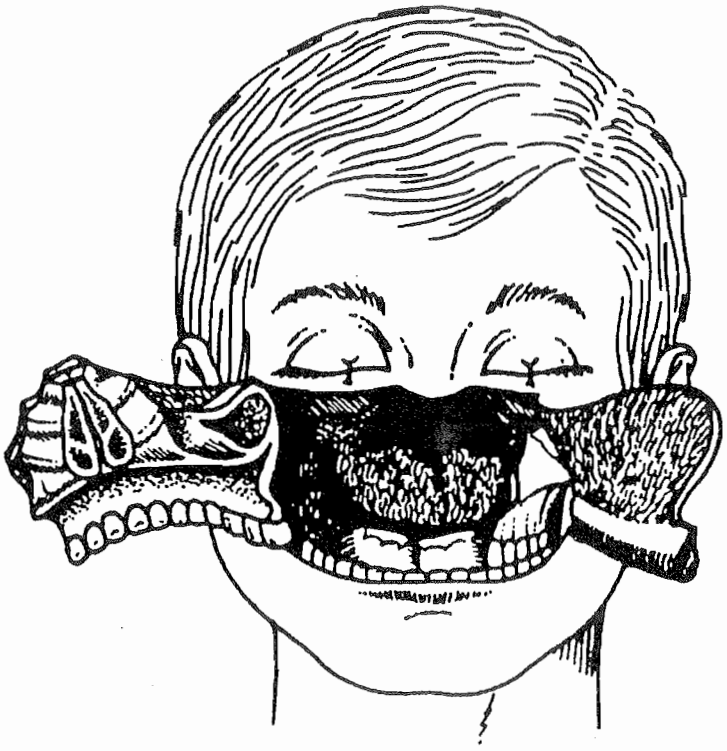

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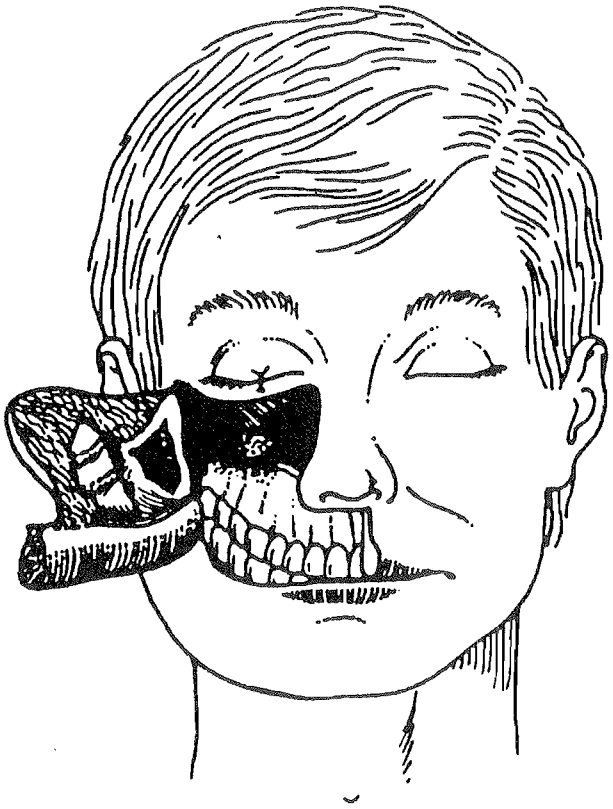

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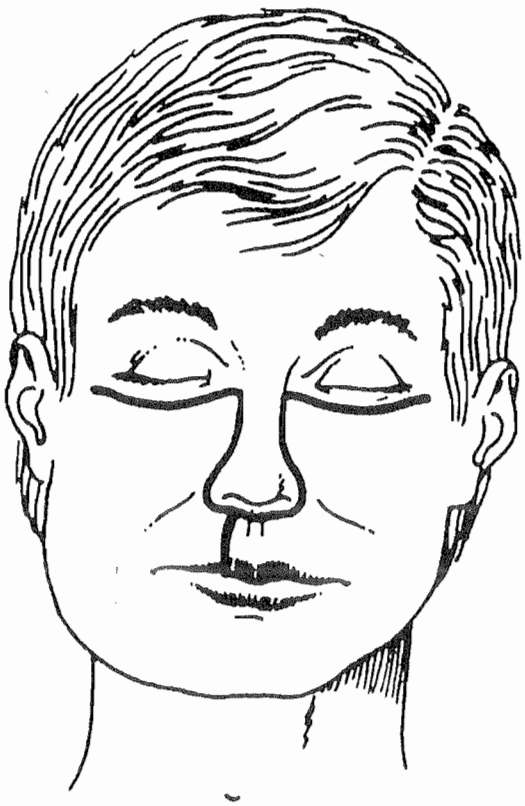

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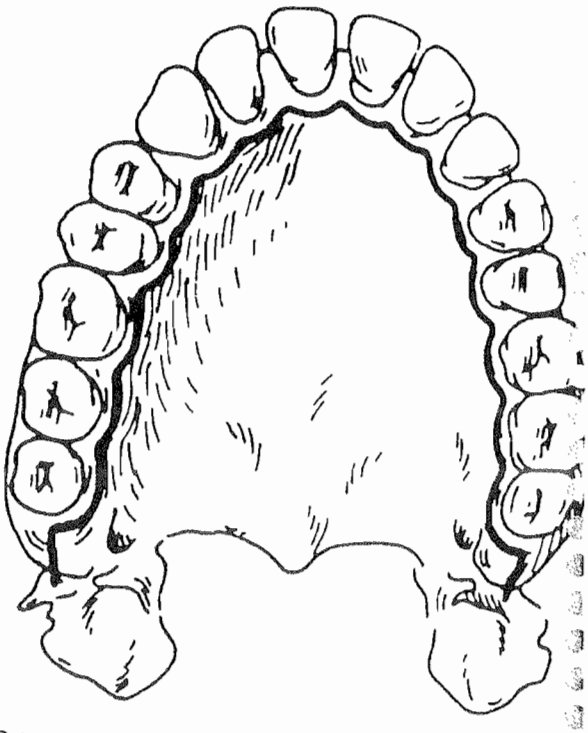

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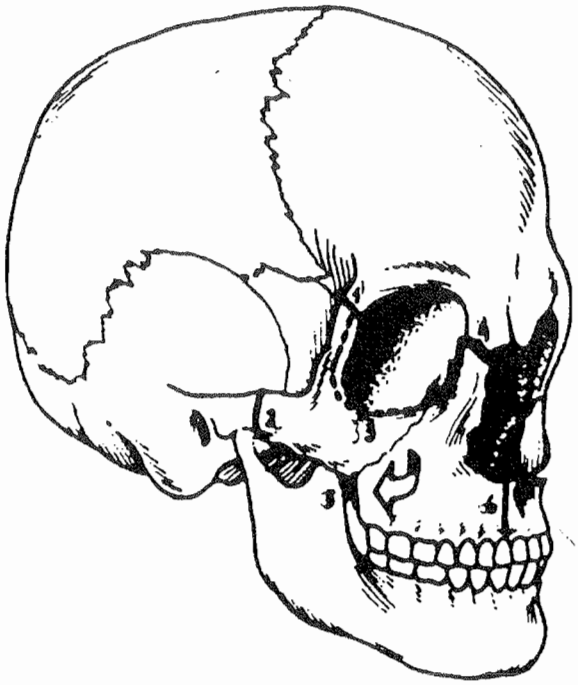

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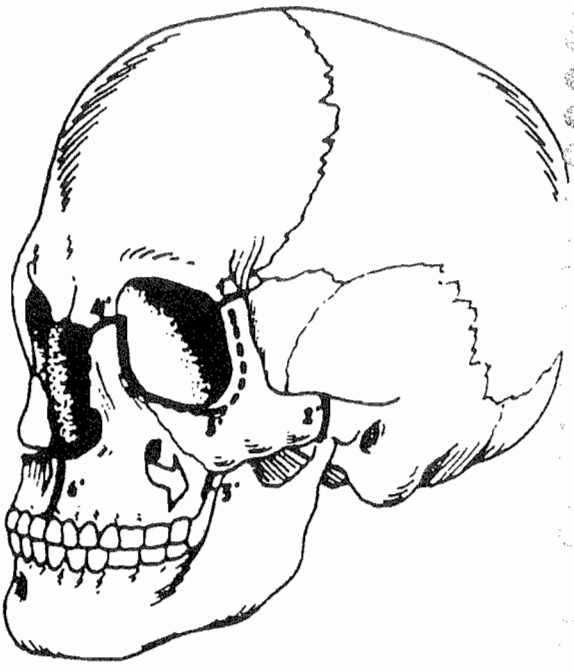

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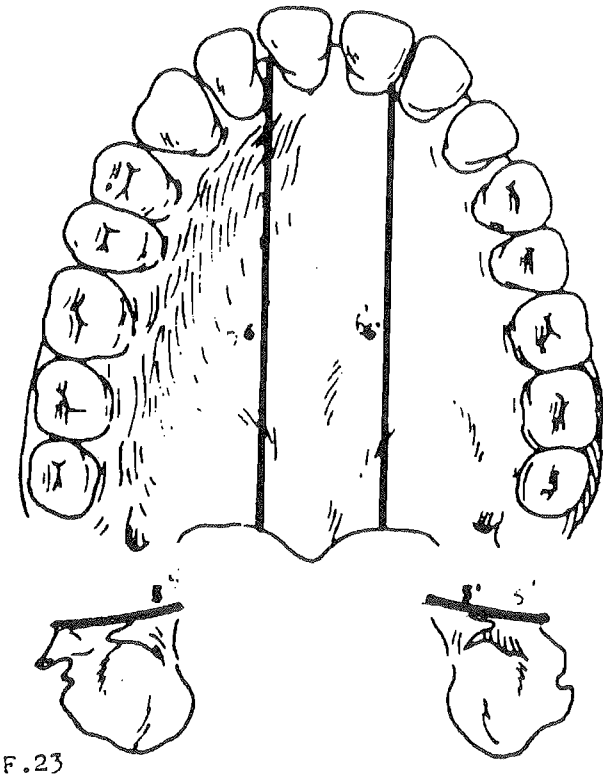

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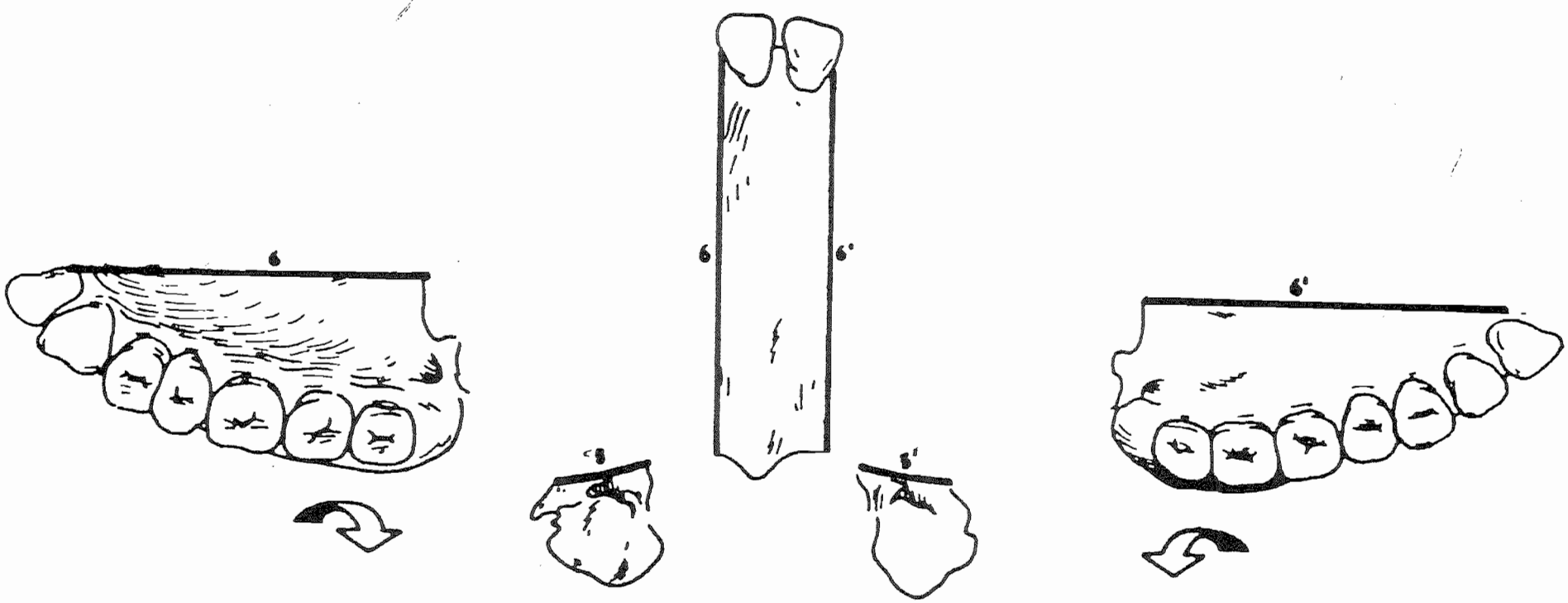

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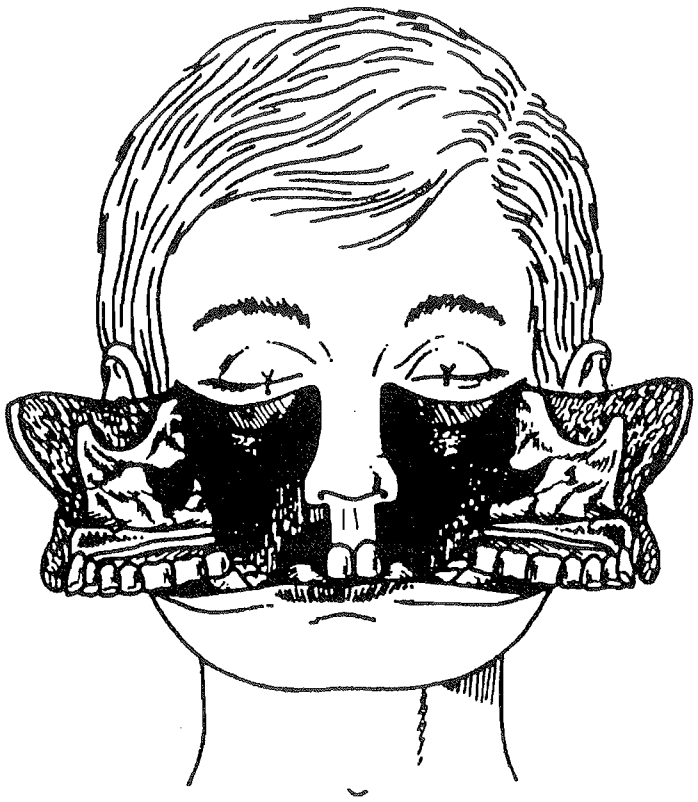

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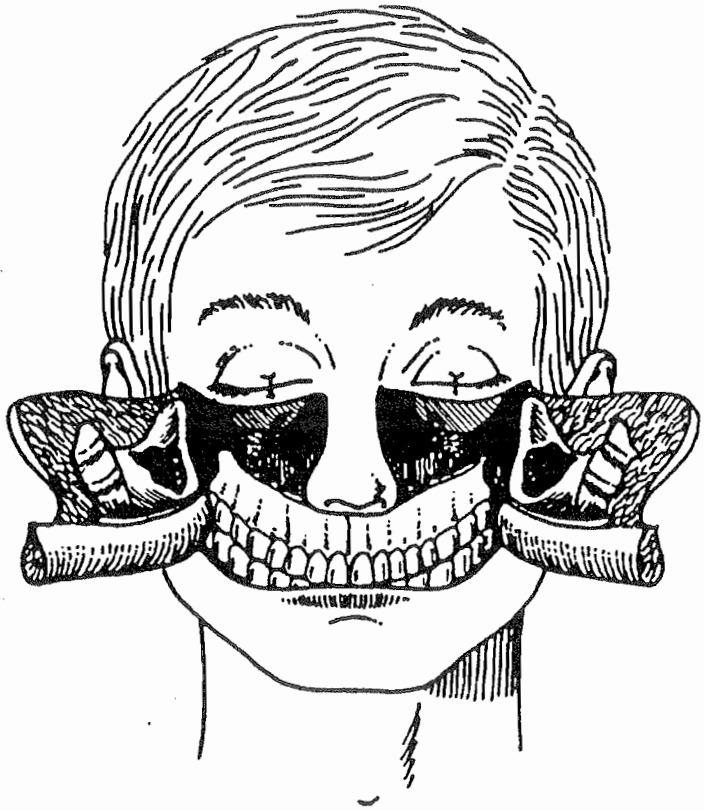

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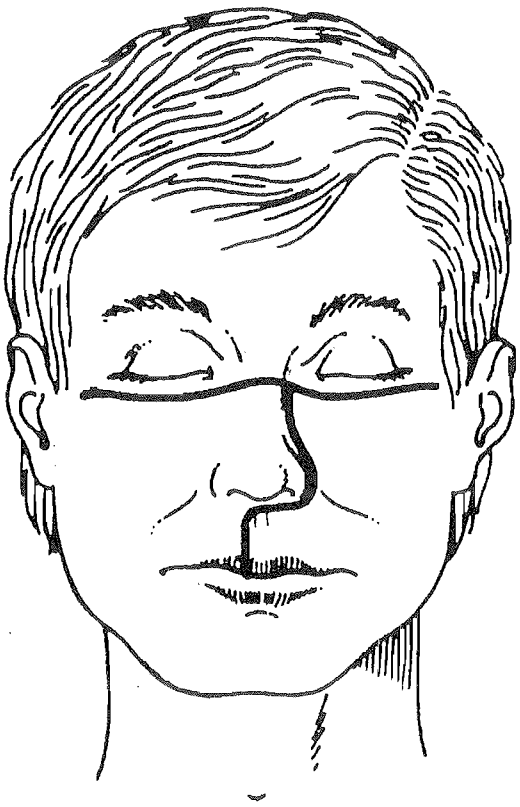

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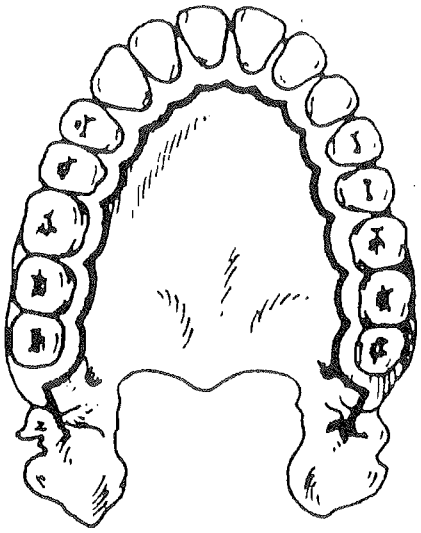

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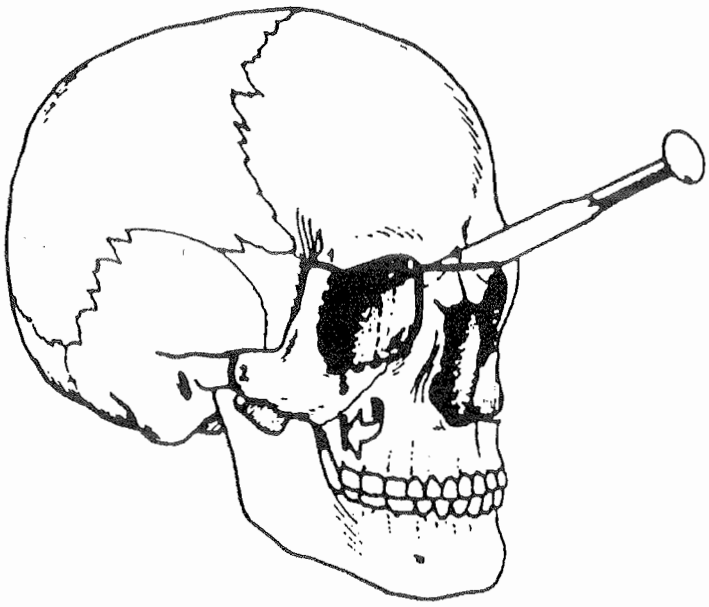

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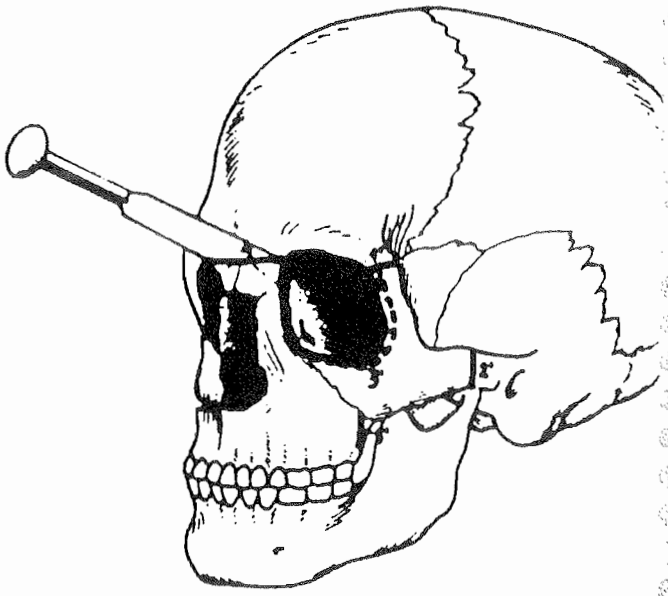

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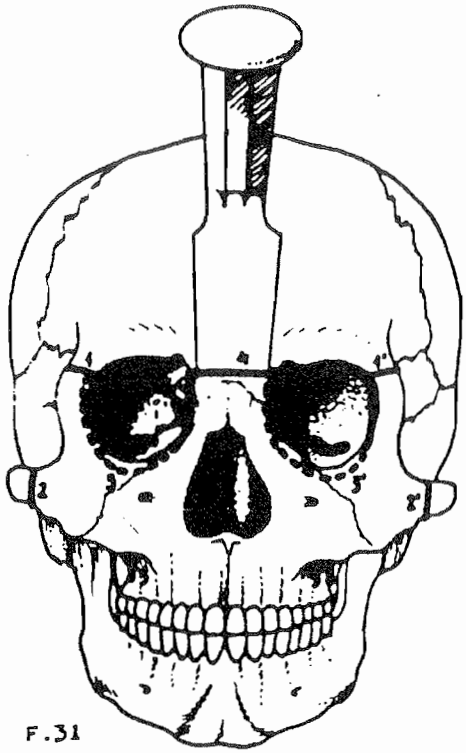

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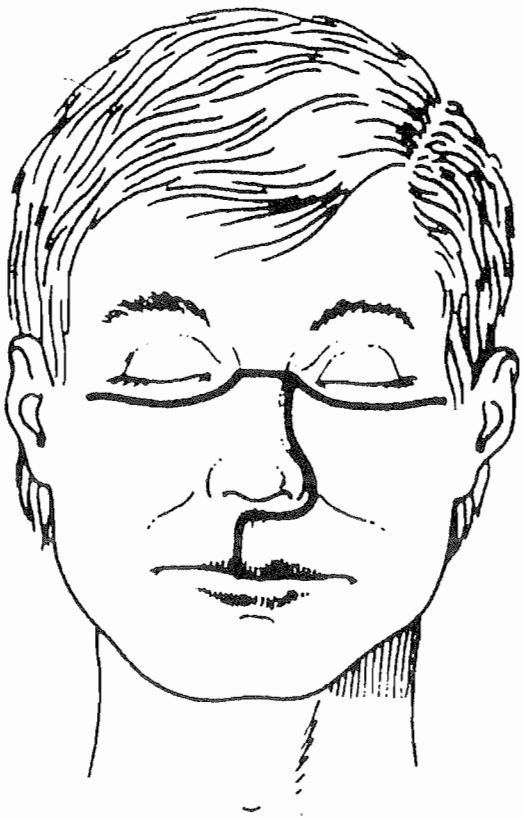

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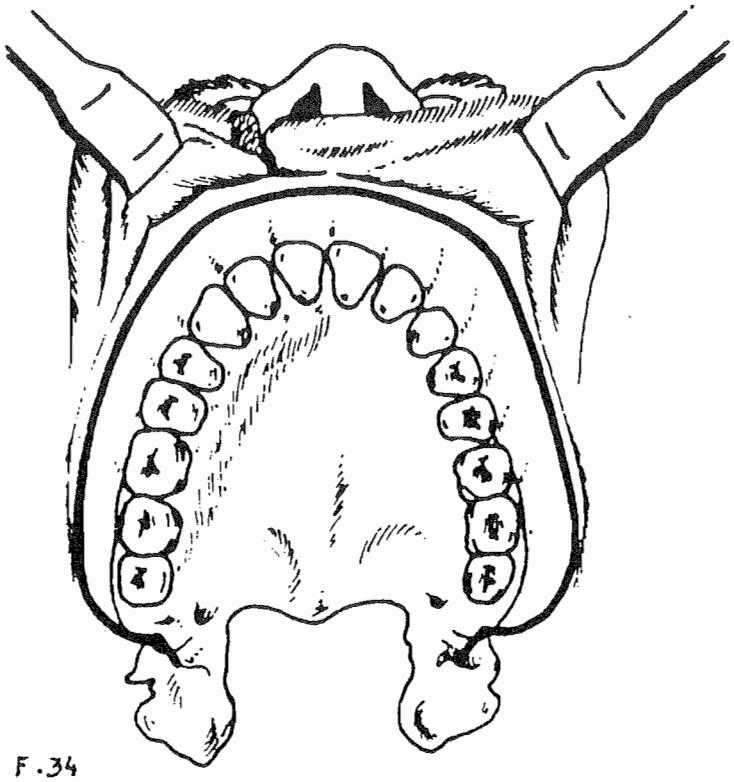

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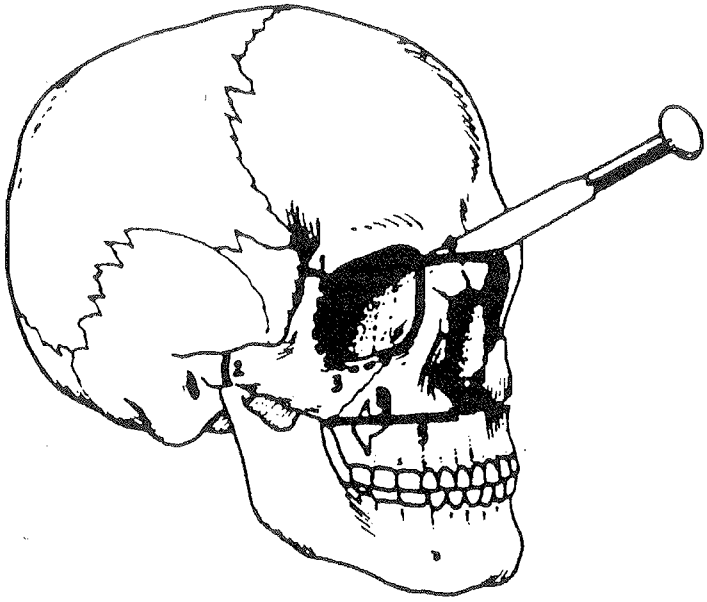

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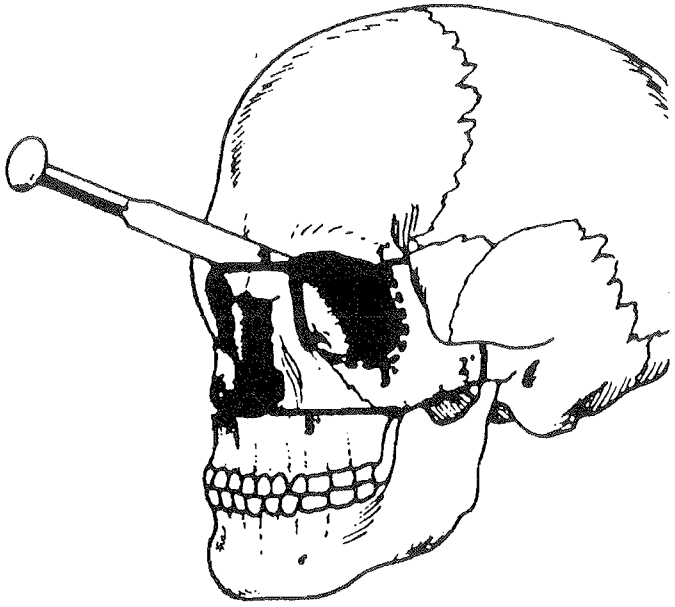

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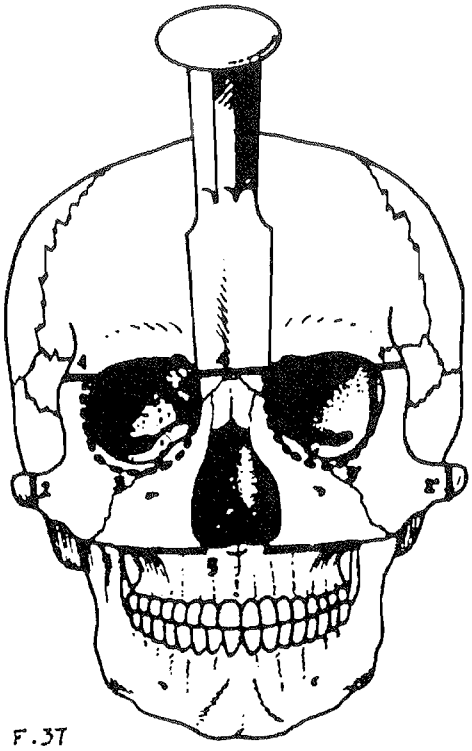

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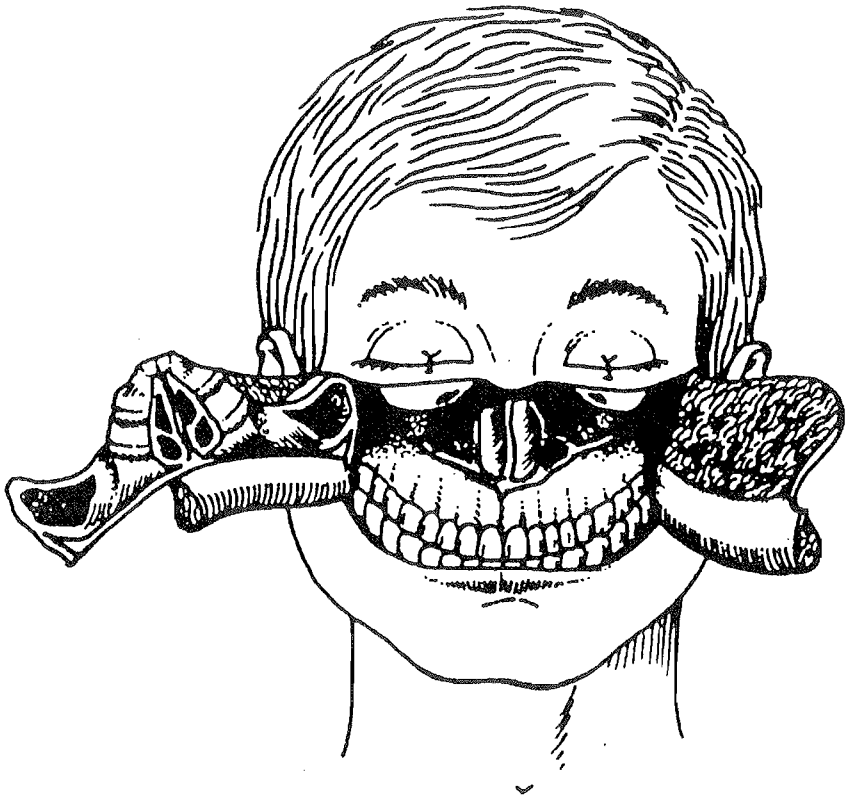

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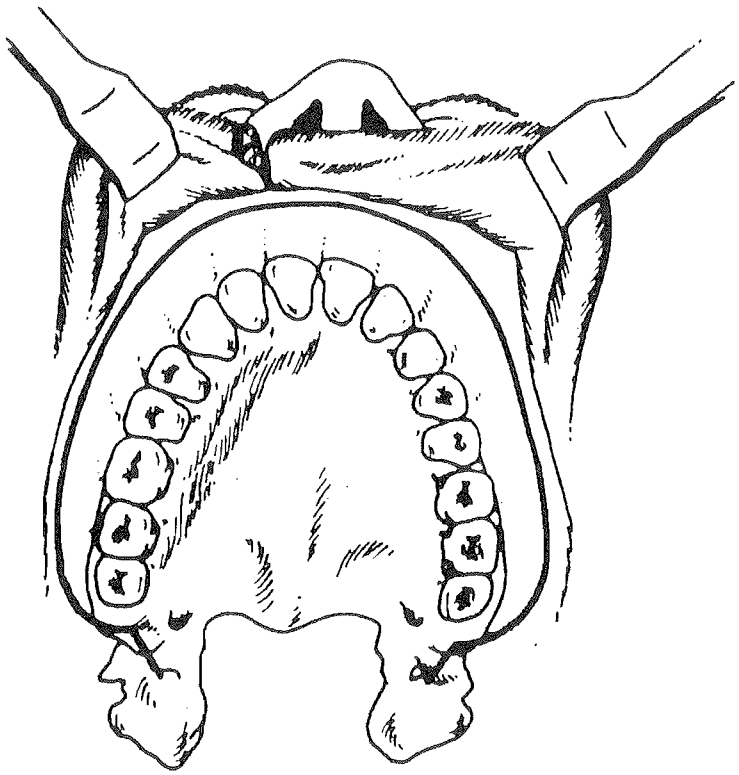

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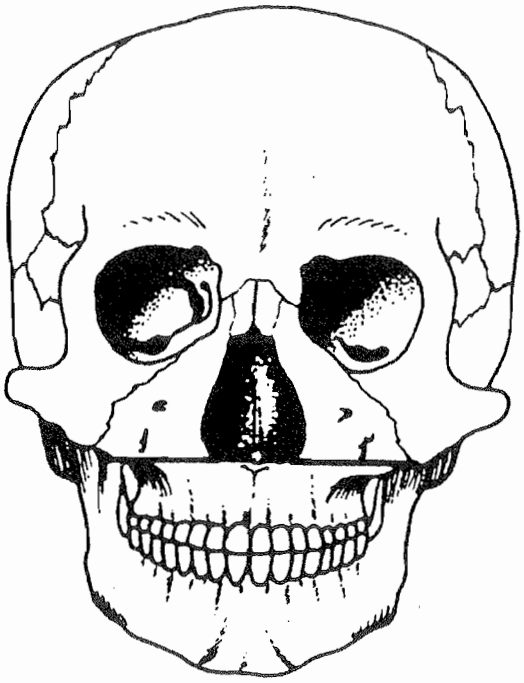

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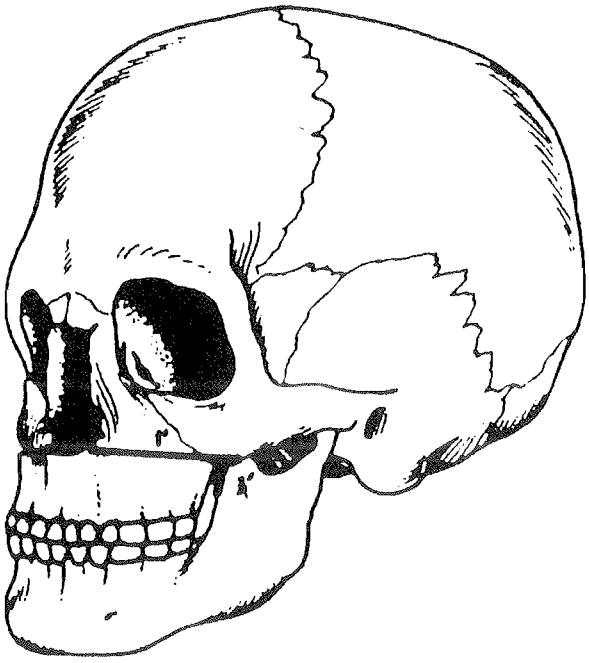

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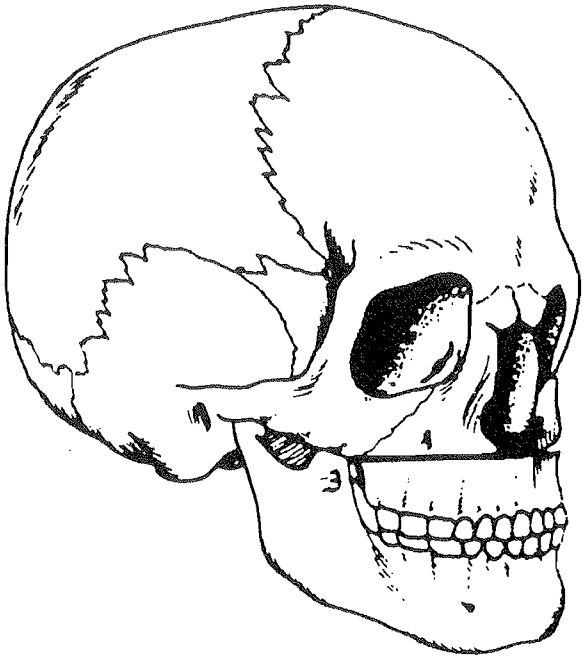

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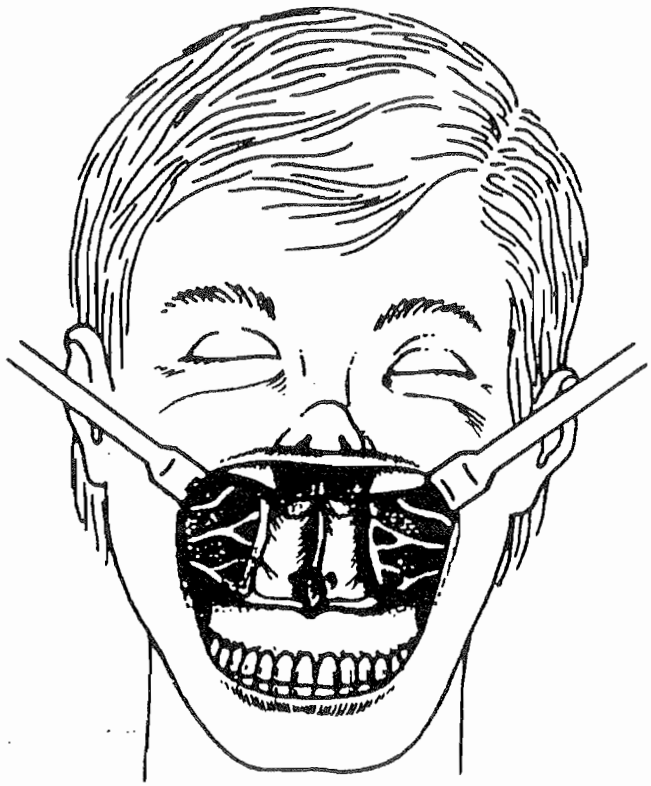

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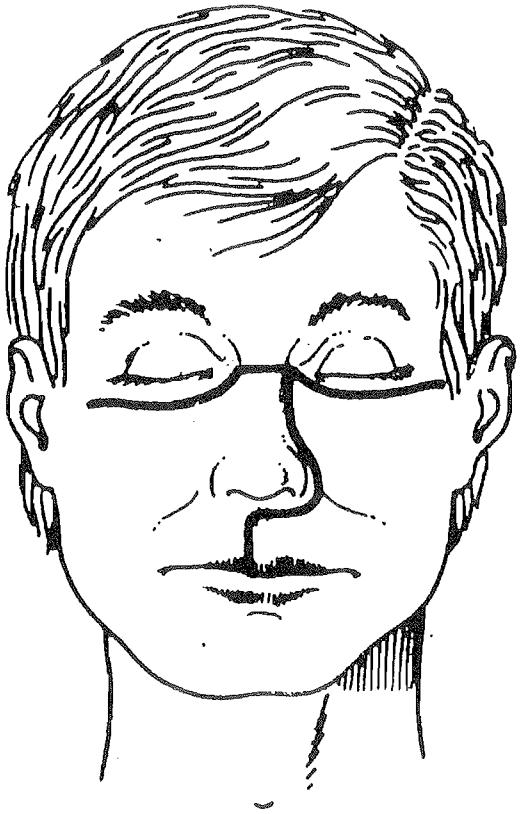

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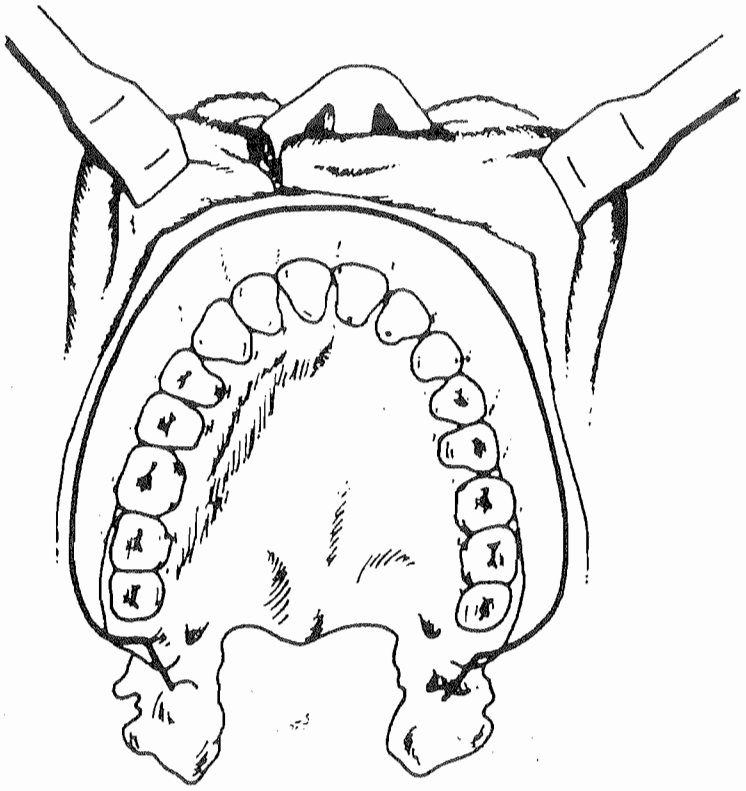

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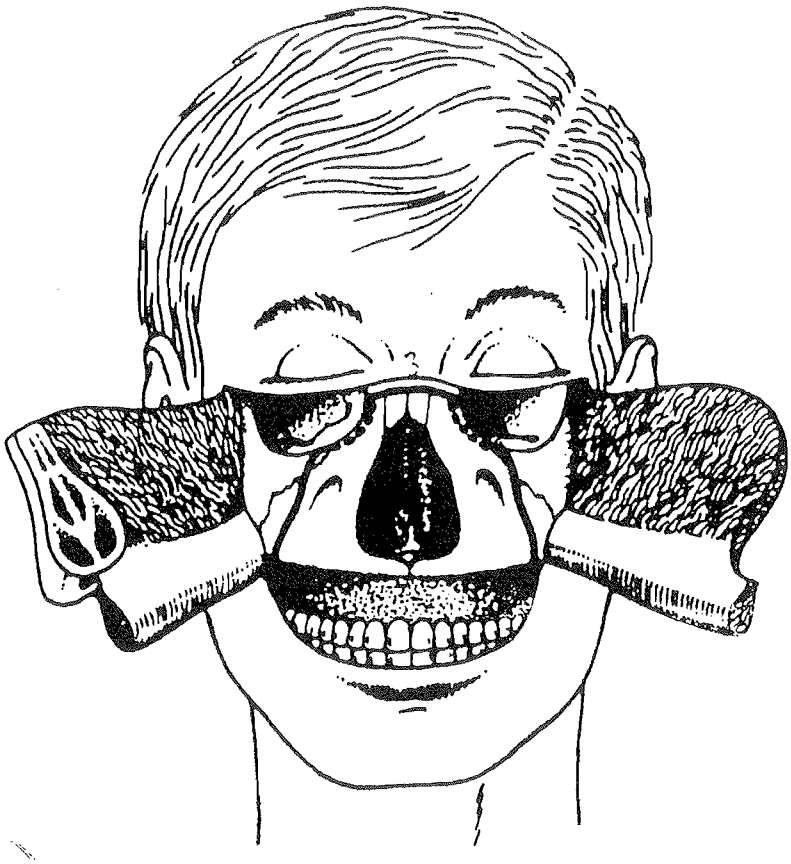

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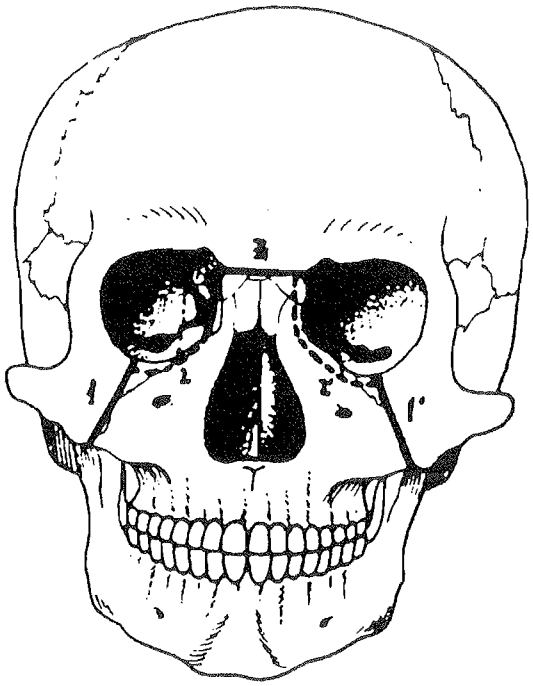

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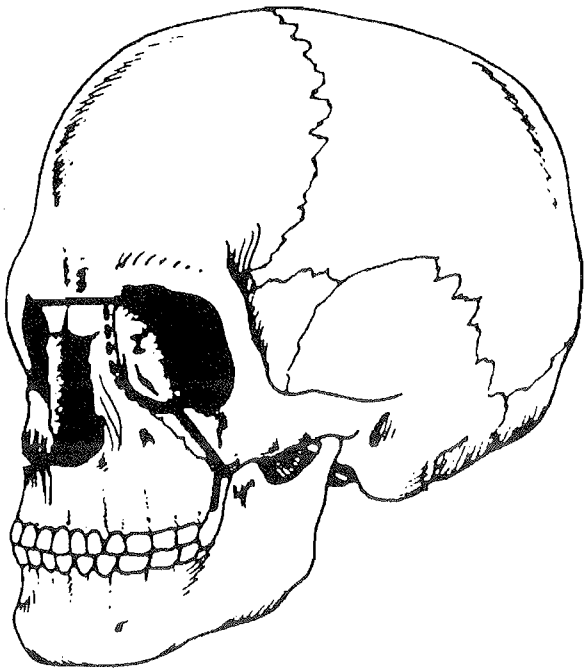

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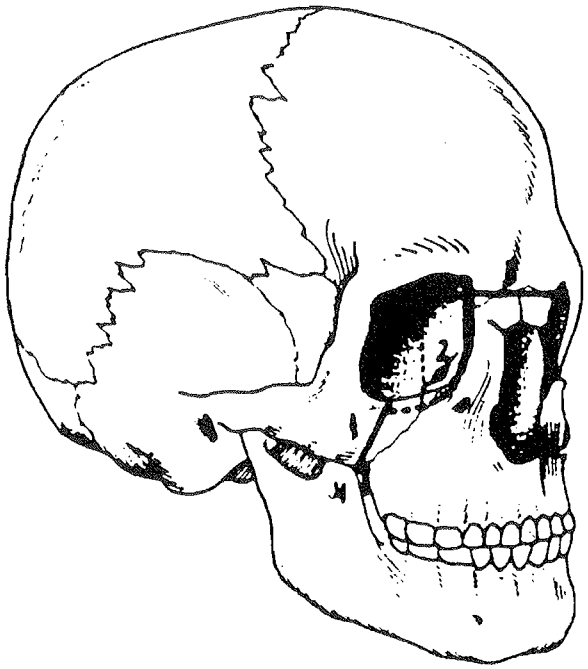

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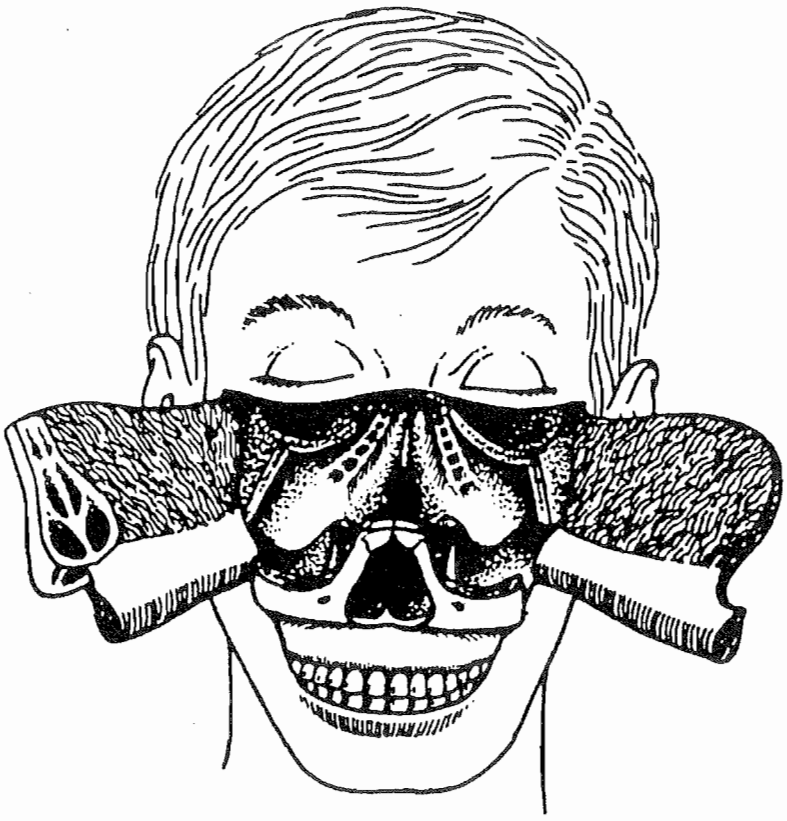

F. 50

F.51

Photograph of the fire enamel which represents the greater unilateral and bilateral techniques.

Technical Improvements in **"Transfacial access into retromaxillary area"** and in other types of osteotomia combining the **"Submental Intubation"**, **"Retronasal Intubation"** and **"Craniofacial Traction Arch"**, which we have developede with this purpose as well as with others, and which we first introduce in:

"Symposium dismantling and Reassembly of the Facial Skeleton".

State of the art-Castellanza (Va). November 26, 1994.

Under the patronage of the "European Association for Craniomaxillofacial Surgery", "European Skull Base Society" and "Italian Society for Maxillofacial Surgery".

INTUBACION ENDOTRAQUEAL POR VIA SUBMENTAL

THE SUBMENTAL ROUTE FOR ENDOTRACHEAL INTUBATION

SERVICIO CIRUGIA ORAL Y MAXILOFACIAL (HOSPITAL "MIGUEL SERVET") ZARAGOZA

AUTOR: F. HERNANDEZ ALTEMIR

CON LA INTENCION DE EVITAR TRAQUEOSTOMIAS, CONSEGUIR UN MEJOR CAMPO QUIRURGICO Y DE FACILITAR EL TRABAJO EN EL TERRITORIO ORAL Y MAXILOFACIAL SE HA DESARROLLADO ESTA TECNICA.

BIBLIOGRAFIA: Rev. Iberoame. Cirug. Oral y Maxilof., 6, 17 (165-193), 1984 • J. oral. Fac. Surg. M. (1986) • V. Congreso Nacional de la Sociedad Española de Investigaciones Quirúrgicas. Zaragoza 1988

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The Submental Route for Endotracheal Intubation

A New Technique

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Submitted 24. 8. 1984; accepted 4. 4. 1985

Summary

A technique of intubation is presented, which can be a valuable alternative to tracheostomy. The tube is passed through a submental incision into the oral cavity.

Key-Words

Intubation – Submental route – Anaesthesia

Introduction

With the intention of avoiding tracheostomies and to make our surgical work easier in chosen cases, the submental route has been developed for endotracheal intubation, thus removing the possibility of its interfering with the oral and maxillofacial territory.

Technique

We need no other material or equipment than that normally used in our surgical duties and the same refers to our anaesthetists.

After normal oral intubation, an incision measuring approximately 2 cm., in the submental and paramedial region is chosen, parallel with the mandibular lower border and at about a finger's breadth from the latter, this may be varied in position and design, depending on the presence of recent wounds, scars, etc. The lower medial mandibular edge is identified using a curved haemostat. The cervical fascia and the skin of the neck are incised, passing the forceps subperiostcally from distal to proximal, about 2 cm. The detached surface coincides with the mandibular-lingual osseous portion, which limits the front and paramedial part of the floor of the mouth. In this way, we preserve the submandibular space.

The mylohyoid muscle is crossed in the area of its mandibular insertion, to reach the sublingual space. Passing gently above this space with our haemostat, we will notice the tip of the forceps next to the area where the lingual alveolar

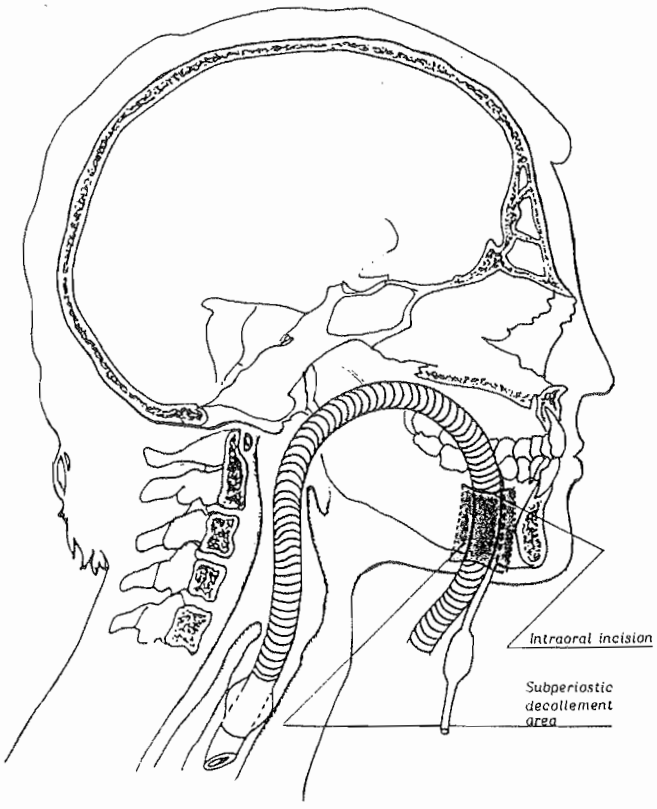

Fig. 1

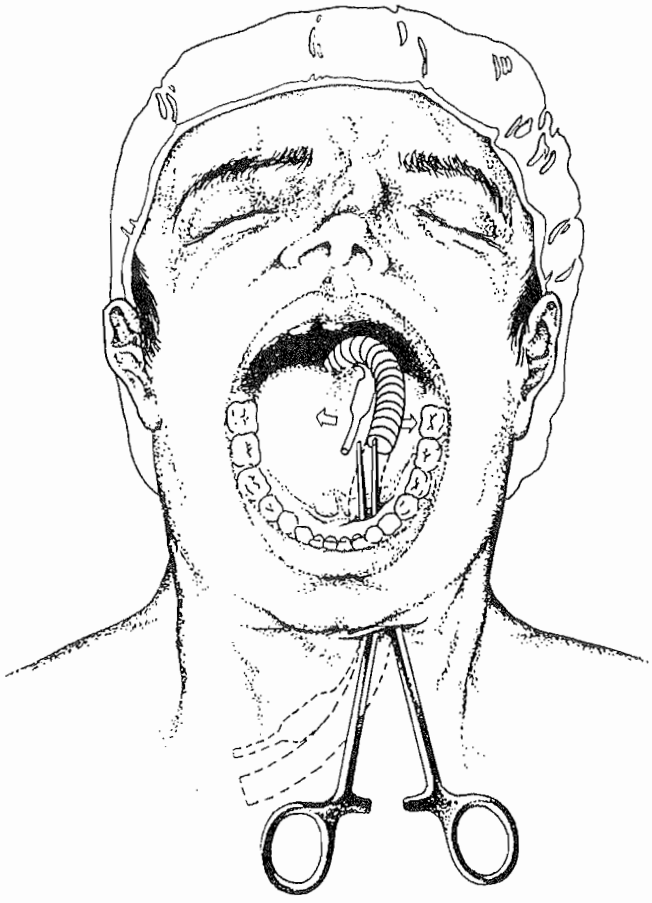

Fig. 2

mucosa is going to reflect to constitute the mucosa of the floor of the mouth.
Where the mucosa is still tightly adherent, an incision is made, parallel with the gingival margin and which measures approximately 2 cm. in length. With the haemostat the lower edge of this last incision is detached.
Through this space, the endotracheal tube has to be passed. With the haemostat we catch the endotracheal tube in the mouth, momentarily deflating the pneumatic cuff, to pass it firstly through our space and then to pass the endotracheal tube itself. A nasal speculum introduced through the submental route can help to pass the endotracheal tube.
When the endotracheal tube is correctly placed, it will be fixed at the submental level, in a similar way to a thorax drainage tube.
Intraorally, the endotracheal tube must be allowed to move from one side of the tongue to the other, to make our intraoral manipulations easier.
Extubation is performed as for any normally intubated patient.
The submental wound is sutured taking advantage of some sutures inserted in advance, without seeking a taut closure, in order to allow thereby a certain degree of drainage.

Discussion

The technique is designed so that the geniohyoid and genioglossus muscles do not have to be crossed, easily sparing also the insertion of the anterior belly of the digastric muscle, as our subperiostal detachment is done behind the latter insertion (Fig. 1, 2).
We will avoid damaging structures such as Wharton's duct and their orifices, the lingual nerve, the sublingual and submaxillary glands. All this is achieved easily, by correctly applying the technique and knowing the anatomy and function of the area.
The endotracheal tube passes, then, through a space which is related to the anterior belly of the digastric muscle, the most anterior portion of the mylohyoid muscle and the lower edge of the mandible paramedially.
With the proposed innovation, the typical surgical manoeuvres of oral and maxillofacial surgery can be done without the interference of intubation through the natural orifices and without having to resort to a tracheostomy.
When the classical endotracheal intubation, nasal or oral, is possible, it will be prefered to our submental route, as it is less haemorrhagic.
Certain disadvantages can be assumed with our technical innovation, which until now we have not seen, but our experience is still very small:
– Infection in the floor of the mouth (careful active or passive oral hygiene is mandatory, prior to the operation).
– Risk of submental fistulae and anomalous scars occurring, if the submental intubation is excessively prolonged.
– Damage to important structures of the floor of the mouth.
The disadvantage of having to make a submental incision has to be weighed against the trauma which accompanies a tracheostomy.

Conclusions

It is a technical innovation which is easily carried out, and which has precise indications based mainly on the advantage of avoiding the interference of the endotracheal tube in the surgical field and which at times has obliged us to carry out tracheostomy.

Acknowledgement

Special thanks are due to Dr. *Marceliano Tamiño Carrillo*, Head of the Anaesthetics and Resuscitation Service of the "Miguel Servet" Hospital of Zaragoza, who has given us all the support necessary to carry out this technical innovation, as well as to our collaborators.

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SUBMENTAL ROUTE FOR ENDOTRACHEAL INTUBATION

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Head of Oral and Maxillofacial Surgery Department

Miguel Servet Hospital. Zaragoza

1.

The Submental Route for Endotracheal Intubation is performed when there is no indication for nasal or oral intubation and when the tracheostomy is to be avoided.

2.

The technique generally begins making a temporal orotracheal intubation.

3.

The endotracheal tube and the external neumatic ball are passed through the hole previously made at the internal side of the paramandibulary region. The structures of the floor of the mouth have to be preserved.

4.

Rubber ringed tube; the neumatic ball stopper can be released to ease the passing through the floor of the mouth.

5.

Endotracheal tube layout, passing through the space created in the floor of the mouth at submentonian and paramandibulary level; it shows its relationships with the insertions of the genihyoid and digastric muscles, not touching them; it pierces the mylohyoid muscle.

6.

The tube has to be loose within the oral cavity in order to be moved, if neccessary.

7.

After the submental endotracheal intubation, the tube is fixed to the skin at the edge of the submental incision; it can be fixed with more stitches in the extraoral portion of the endotracheal tube.

8.

The manouvres of reducing facial fractures, intermaxillary fixation, etc. are possible without any interference from the endotracheal tube.

9.

After the oral, maxillofacial and/or craniofacial surgery, the patient can be left with the submental tube.

10.

The endotracheal tube is removed in an aseptic environment and the stiches that were left before are used to close the incision.

11.

The tracheostomy has not been needed. The sequels due to the submental incision are far less important than the produced by a tracheostomy, although this is a technique that still has its indications.

I would like to thank Dr. Marceliano Temiño Carrillo, Head of the Anesthesiology and Reanimation Department of the "Miguel Servet" Hospital of Zaragoza.

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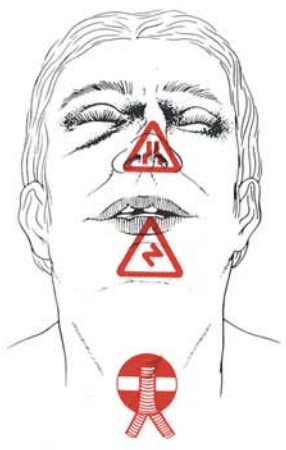
INTUBACION ENDOTRAQUEAL POR VIA SUBMENTAL

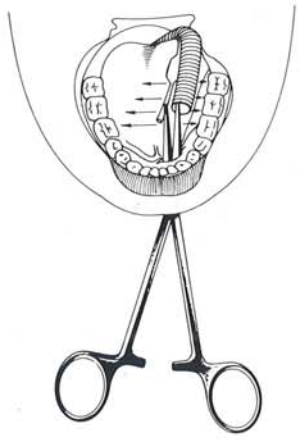
Dr. F. Hernández Altemir

JEFE DEL SERVICIO DE CIRUGIA ORAL Y MAXILOFACIAL
DE LA CIUDAD SANITARIA MIGUEL SERVET DE ZARAGOZA

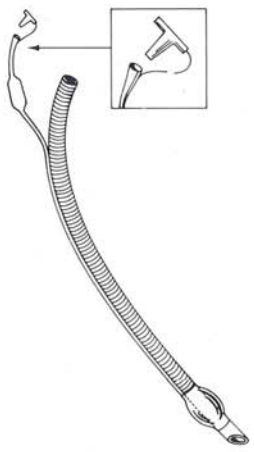


—La intubación endotraqueal por vía submental, se realiza, si no existe indicación para la oral o nasal y se quiere evitar la traqueostomía.

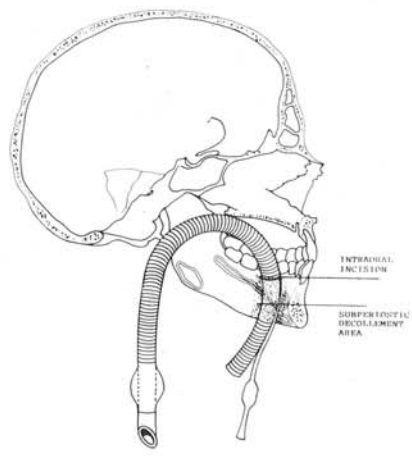
—Se suele iniciar la técnica con intubación orotraqueal temporal.



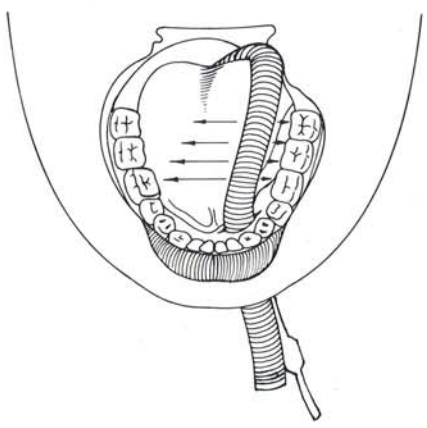
—El tubo endotraqueal y el baloncito neumático externo se hacen pasar a continuación por el espacio diseñado al efecto en la cara interna de la región paramandibular, **respetando las estructuras del suelo de la boca.**



—Tubo anillado de látex-caucho, al que se le puede soltar el tapón del baloncito neumático, para facilitar su paso por el suelo de la boca.

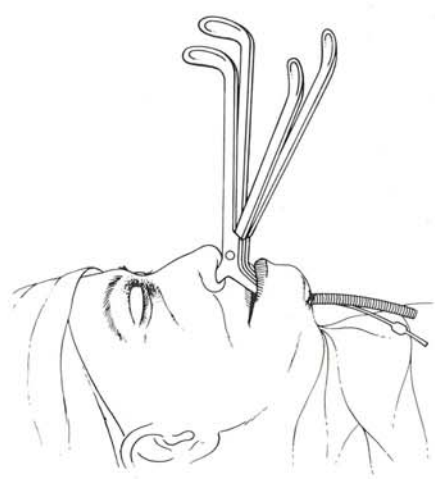


—Disposición del tubo endotraqueal, atravesando el espacio creado en el suelo de la boca a nivel submentoniano y paramandibular, observándose sus relaciones con las inserciones de los músculos genihioideos y digástrico, a las que respeta, y atravesando el músculo milohioideo.

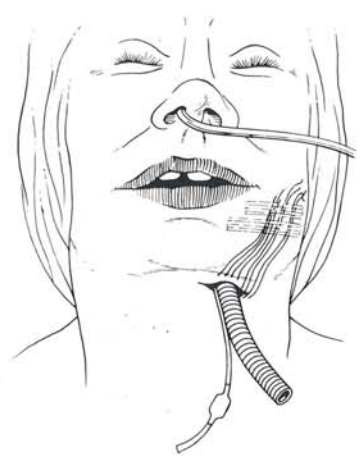


—El tubo en la cavidad oral debe permitir su desplazamiento a uno y otro lado de la lengua para así facilitar el trabajo en la región.

—Concluida la intubación endotraqueal por vía submental, se fija el tubo a la piel, en el borde de la herida submental, pudiéndose dar algún otro punto de fijación a lo largo de la porción extraoral del tubo endotraqueal.

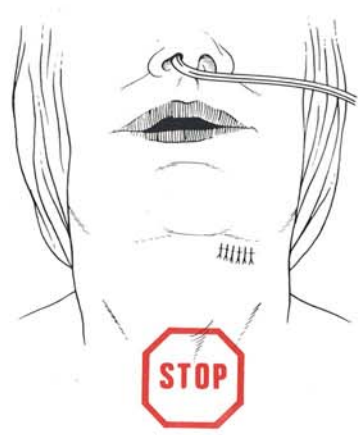


—Las maniobras de reducción de las fracturas faciales, fijación intermaxilar, etc., son posibles sin la interferencia del tubo endotraqueal.



—Concluida la intervención en el territorio oral y maxilofacial y o craneofacial, se puede dejar al paciente intubado por vía submental.

—Una vez retirado el tubo endotraqueal por vía submental, en un ambiente adecuado, como es el caso de un quirófano o en su defecto en la U.V.I., se aprovechan para el cierre de la herida submental, las suturas previamente dispuestas al efecto.



—La traqueostomía, no ha sido necesaria. La secuela ocasionada por la herida submental es de menor entidad que la producida por una traqueostomía, intervención que, no obstante, sigue teniendo sus indicaciones.

Agradecimiento al Dr. D. Marceliano Temiño Carrillo, Jefe del Servicio de Anestesiología y Reanimación del Hospital "Miguel Servet", de Zaragoza, por las facilidades y colaboración en la realización de la técnica.

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CRANIOFACIAL TRACTION ARCH
A NEW DEVICE

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INTRODUCTION

It is with the aim of facilitating some surgical procedures in the area of oral and craniofacial surgery and making craniomandibular tractions in several congenital or acquired diseases (traumatisms, oncological patients, etc.) that we have developed a Craniofacial Traction Arch.

MATHERIALS

The device consists of an arch which morphologicaly resembles a "question mark" (?). It has got four pointed screws, so as to allow the subjection on the skull.

We may distinguish two parts: a cranial part, where the fixation screws are attached, and a facial and submandibular part, from where the traction is to be made.

In this case it is made out of stainless steel, hexagonal rod of 13 mm with screw thread size 8, screws 70 mm of length and a nut size 8 to prevent the detachement of the screws after attached on the skull.

The orientation of the device is variable, in order to suit the kind of traction which is desired. To carry out with the traction, anchorage points must be made on the jawbone(s), so that it is possible to pull and fix it to the maxillary-mandibular part of the arch.

METHODS

In craniofacial, oral and maxilofacial surgery, it has become rather necessary to dispose of some contrivance which allows to make traction or fixation of different structures.

Our device is easily attached and different types have been made suiting neonatus, children and adults. It does not require to make any previous incision to use it.

There are multiple situations in which due to various causes (Pierre Robin Syndrome, bicondyloid fracture, bilateral fracture of mandibular angle, oncological patients, etc.) it is of vital importance to prevent the tongue's falling

on the supraglotic region.

Our device, while other techniques are developed, may be of some help to improve the ventilation of the patient avoiding tracheotomy or intubation.

It is not our purpose to describe in this introduction of our arch all of its uses, as each specialist will find out its utility in any concrete situation in which a patient can have some benefit from a craniofacial traction.

The arch allows other devices to be attached to it, serving thus not only as a support for tractions, but also for immovilization of craniomaxillary and/or mandibular pieces, subjection of ventilation devices, progresive reduction of fractures, etc..

CONCLUSIONS

We have developed a device of easy application which, when the patient is conscious, can be attached after infiltrating with local anæsthesia the points where the screws are to be fixed. The orientation of the arch will be chosen according to the technical requirements of the procedure.

Rather than making a list of all its uses, we would like to point out some of the indications of our invention:

-In the Pierre Robin Syndrome, with the purpose of overpassing the situations described above, though not necessarily to avoid tracheostomy or long time intubation(in the neonatus it is essential to make sure that the insertion area for the screws does not coincide with any of the fontanels, for obvious reasons).

-In patients, either toothless or not, with bilateral fracture of the lower jawbone, which causes retraction of the tongue towards the supraglotic region.

-To keep apart the osteotomized maxillary bones in cases of surgery of the skull base, etmoorbitary areas, cavum and sella turcica, etc..

-In the surgical treatment of the temporomandibular ankylose -uni or bilateral- in order to mantain the spaces provided by osteotomia and thus make possible the rebuilding of the temporomandibular joint (TMJ), etc..

-In temporomandibular ankylose, uni or bilateral.

-In cases of condyloid fracture to facilitate its reconstruction or at open surgery of the TMJ.

-In general terms, our device can be useful in all those cases in which a craniomandibular traction is required.

SUMARY

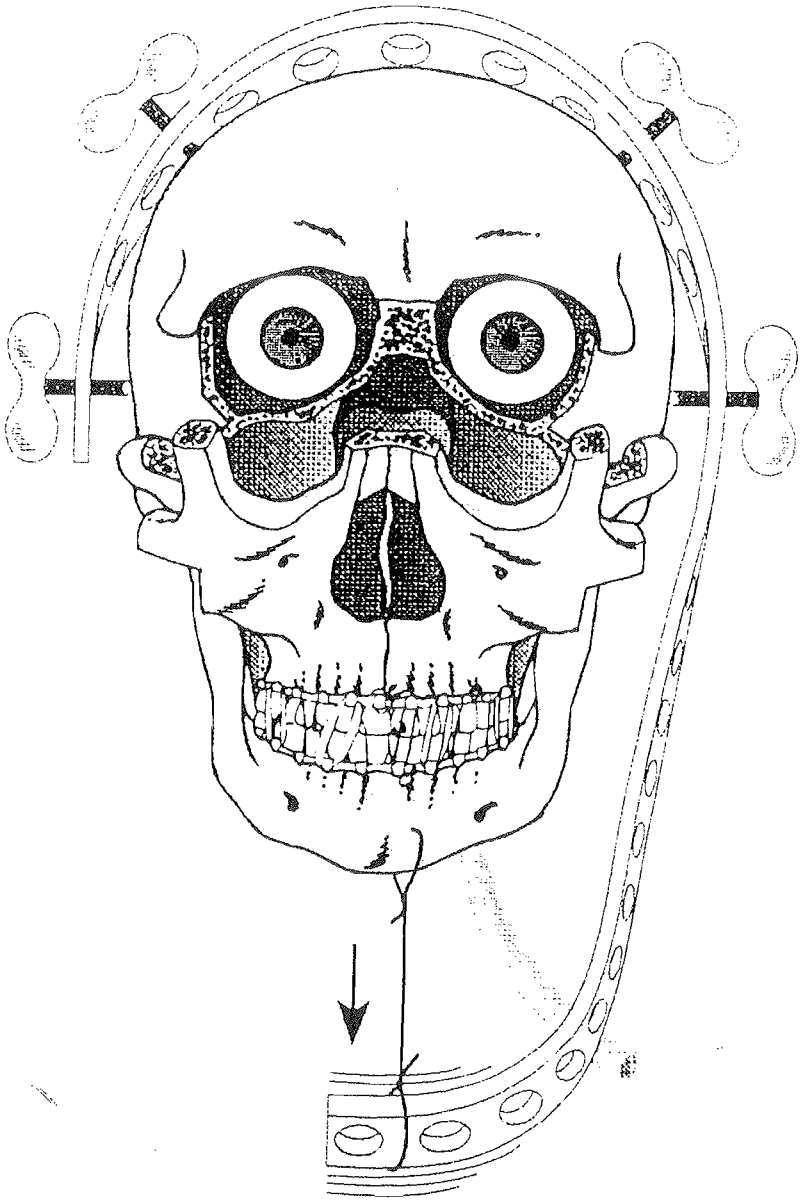
A new device is described, the CRANIOFACIAL TRACTION ARCH, which has a wide field of possibilities, and which improves the capacity of handling of the surgeon within the areas of head and neck.

Departments of Intensive Care and Reanimation can take profit from its use.

KEYWORDS

Craniofacial Traction Arch

Fig. 1: The craniofacial arch allowing, by means of the intermaxillary blockade, the traction of the maxillary-mandibular bulk.



Access into nasal and rhinopharyngeal space and skull base by means of an Osteotomia Le Fort I, making use of the Craniofacial Traction Arch and Submental Intubation.

Fig. 1. Osteotomia of the type Le Fort I.

Fig. 2. The Osteotomia Le Fort I is designed after the submental intubation has been made and the Craniofacial Traction Arch has been atached as well as the intermaxillary blockade, so that it is possible to pull down the maxillary-mandibular bulk from the chin, by means of a wire, or else from the blockade splints, passing the wire by percutaneous way.

Fig. 3. It is possible to appreciate the surgical area which is obtained, leaving clear for our work the nose, rhinopharyngx, oral cavity and skull base, being absent the disturbance of the anæsthesic tube. In adition, the traction allows a wider movement of the osteotomized jawbone.

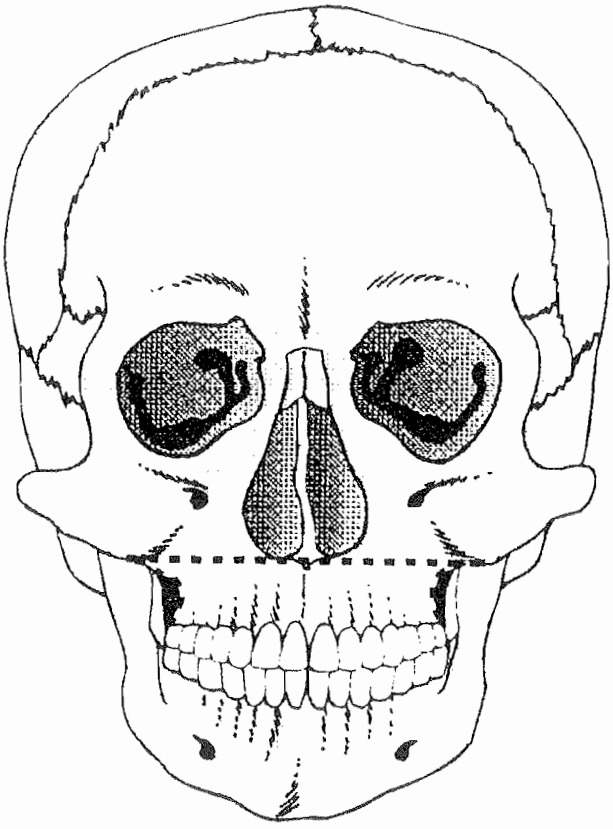


FIG.1

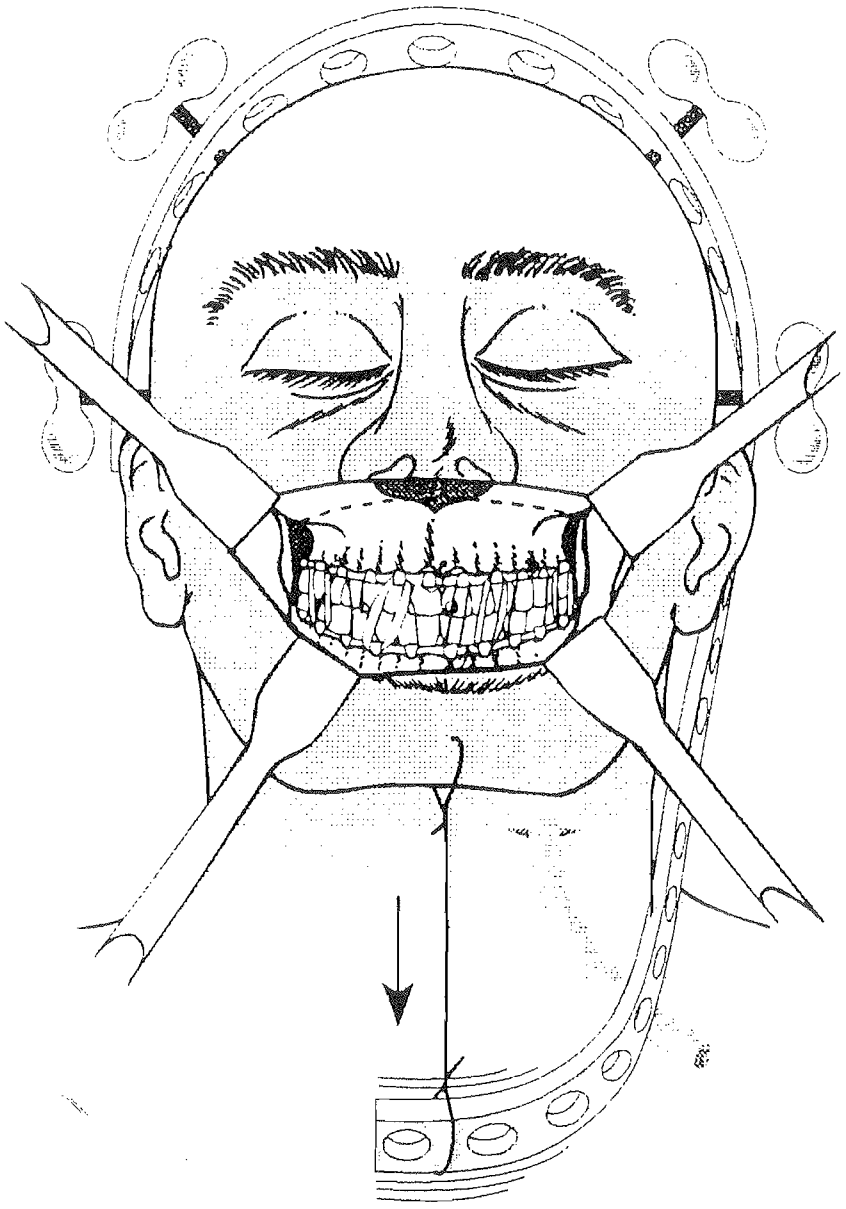


FIG. 2

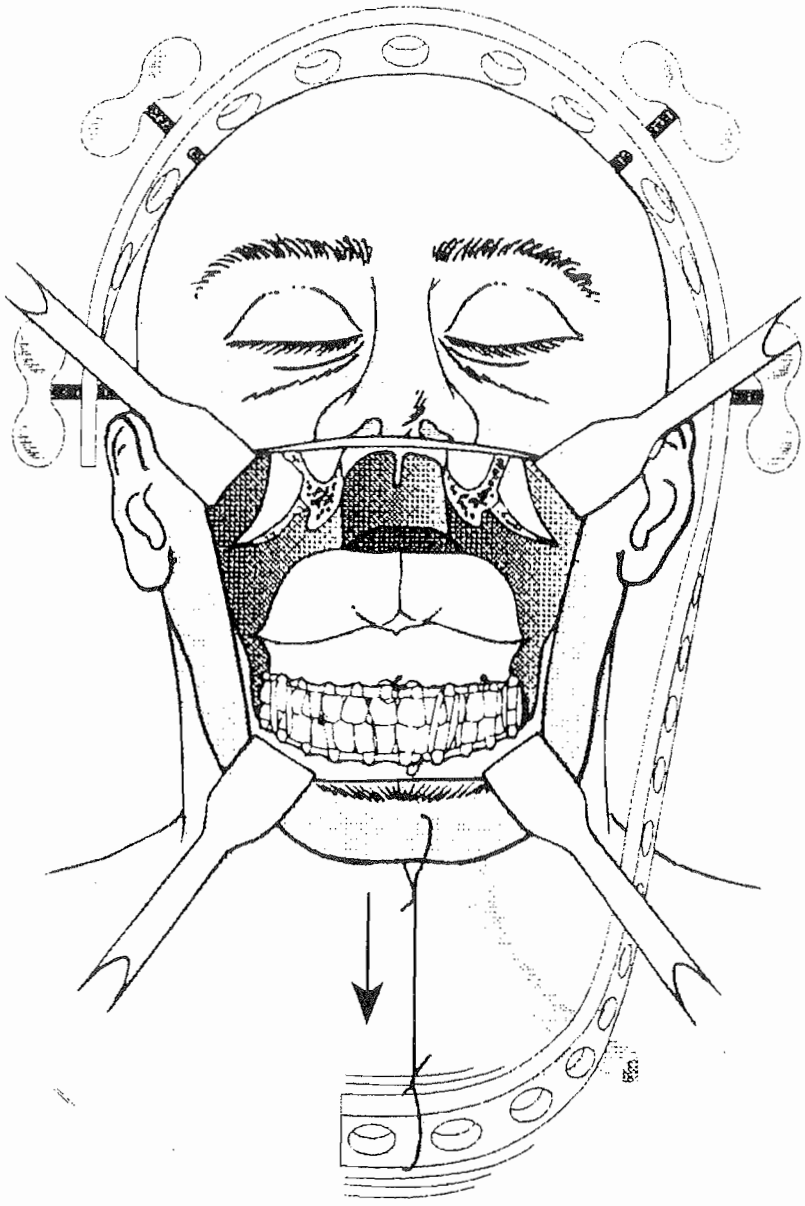


FIG.3

Access to the skull base by means of a Le Fort II Osteotomia and the help of the Submental Intubation, intermaxillary blockade and Craniofacial Traction Arch.

Fig. 1. Design of the cutaneous incisions. The oral ones are parallel to the labial fraenum and they follow in both sides the gingival border or the end of the vestibulum. The palatine fibromucose is not separated.

Fig. 2. Design of osteotomias.

Fig. 3. Design of our surgical act. There is a main flap which comprehends the nasal pyramid and another one which comprehends paramedial region of the other side. There can also be observed the Submental Intubation, the Craniofacial Traction and the intermaxillary blockade.

Fig. 4. Aspect of the surgical area and the subcranial space obtained.

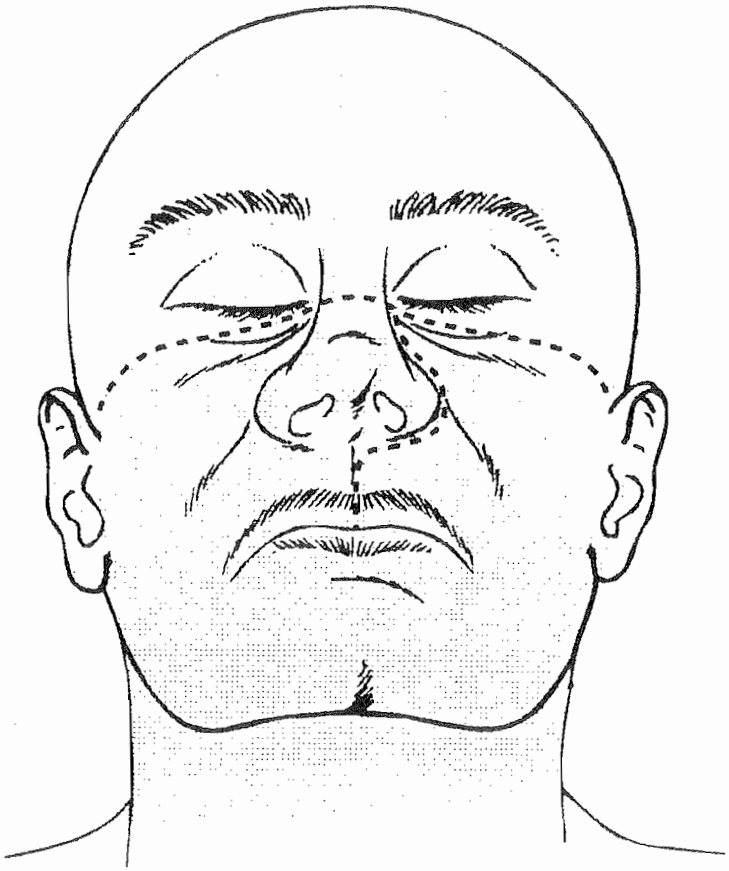


FIG.1

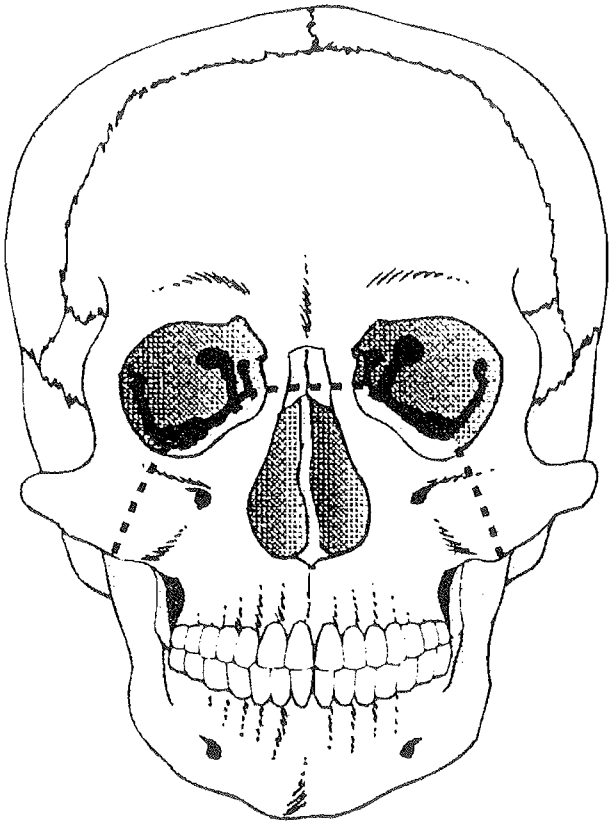


FIG.2

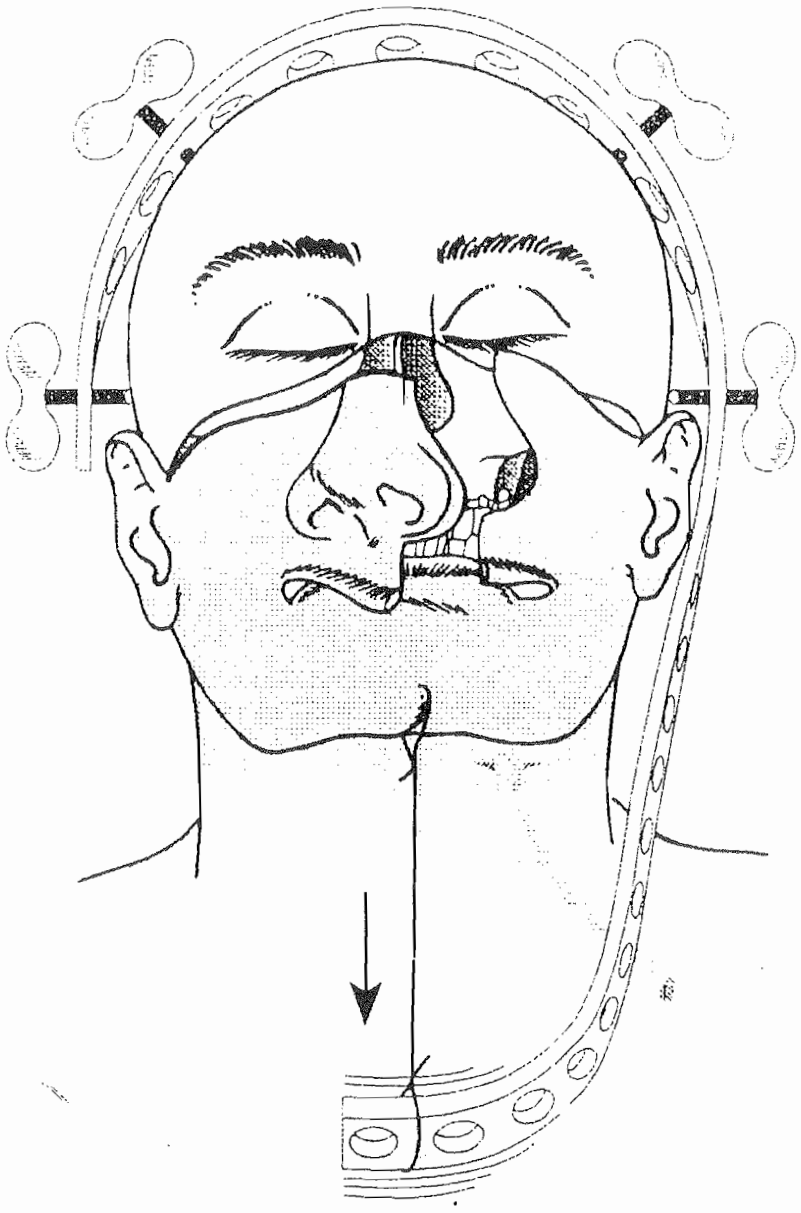


FIG.3

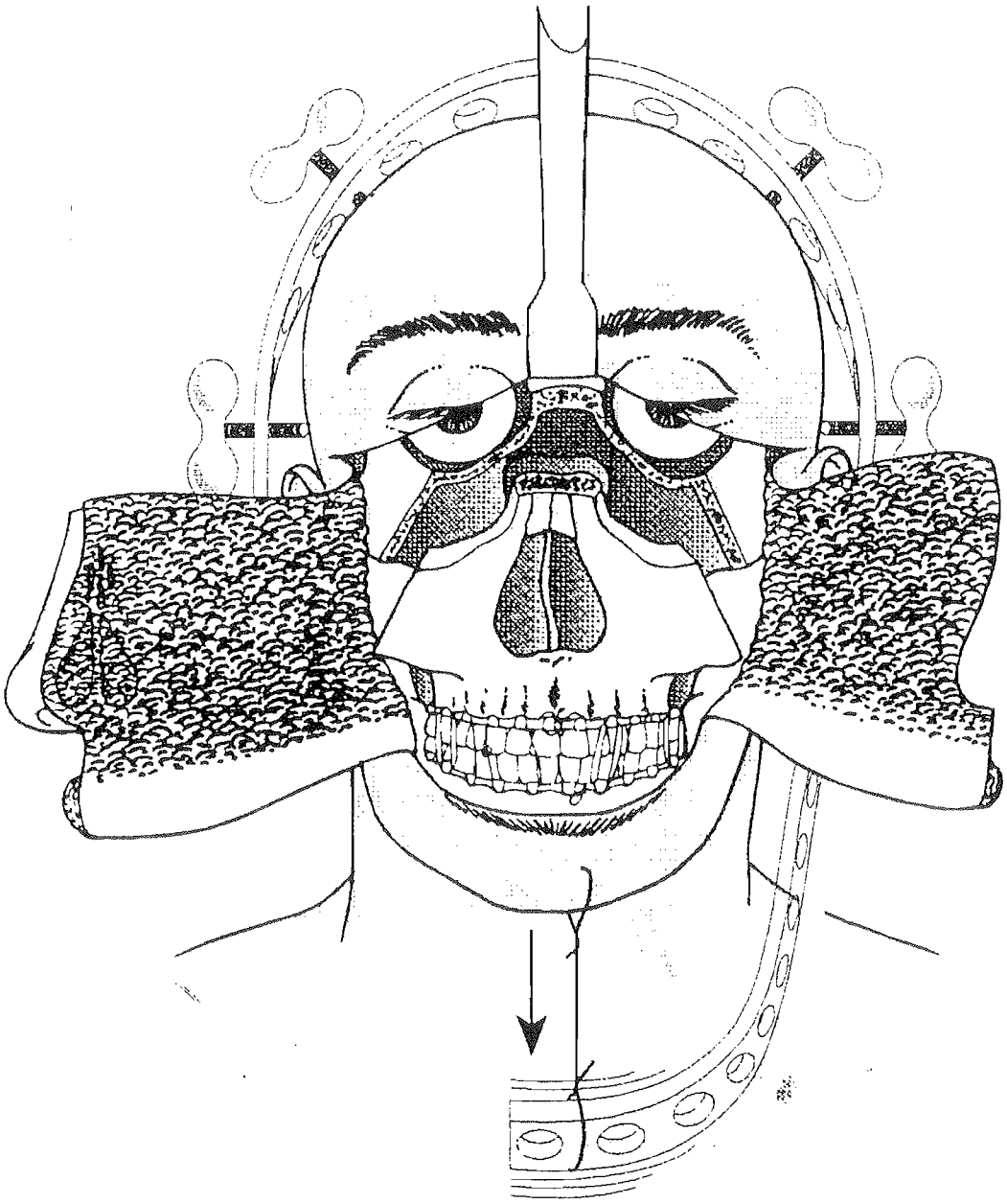


FIG.4

Access to the skull base by means of Le Fort III Osteotomia through a coronal incision, Craniofacial Traction Arch and Submental Intubation.

Fig. 1. Design of the incision, location of the Craniofacial Traction Arch and the Submental Intubation.

Fig. 2. Design of the Osteotomia of the type Le Fort III.

Fig. 3. Detachment of the pericranial flap in order to make the osteotomia.

Fig. 4. Look of the surgical area of subcranial predominance acquired by means of a craniofacial traction, intermaxillary blockade and submental intubation.

Fig. 5. The flesh has been put aside to show more plainly our surgical procedure.

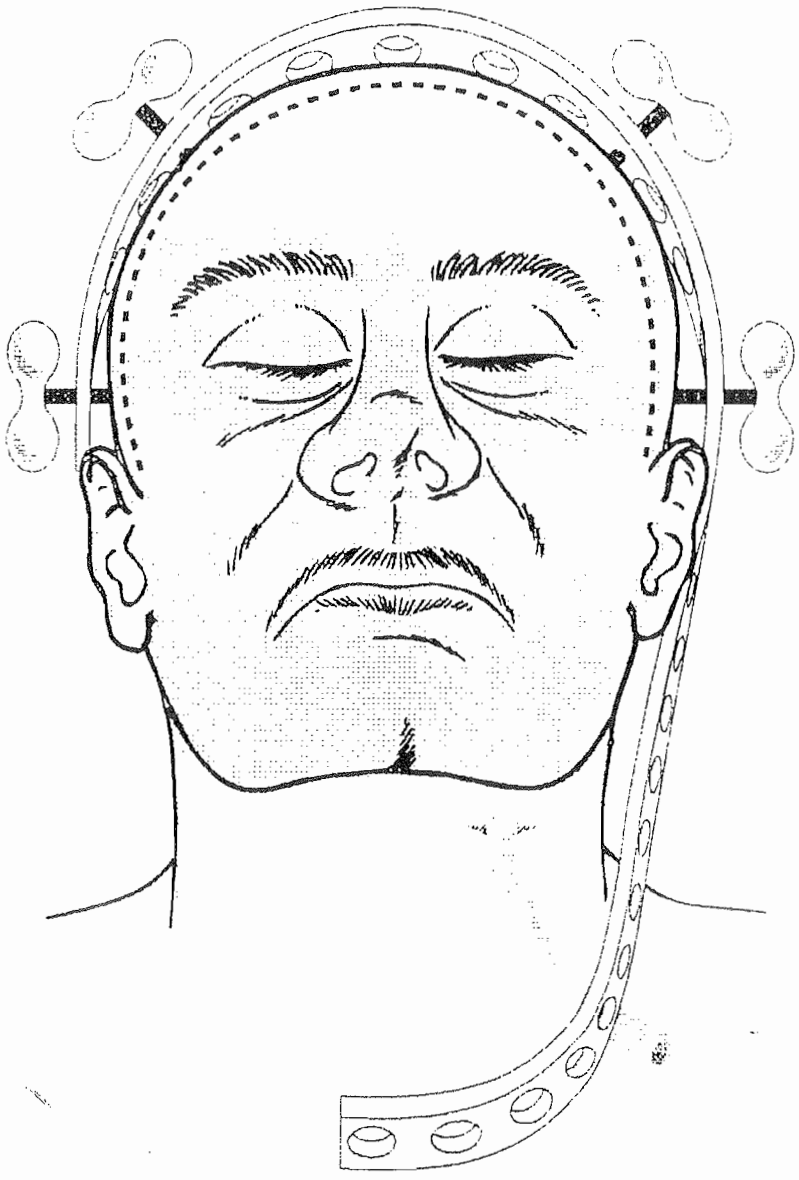


FIG.1

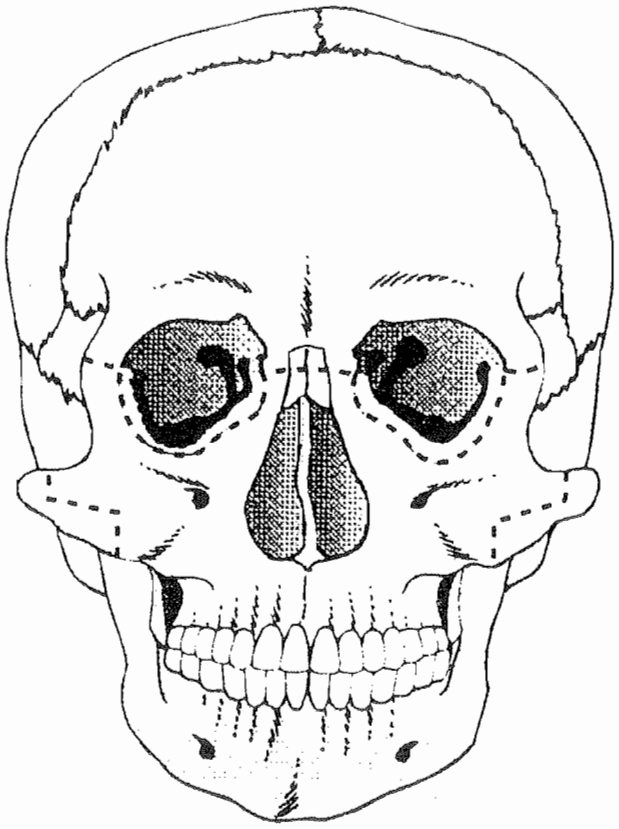


FIG.2

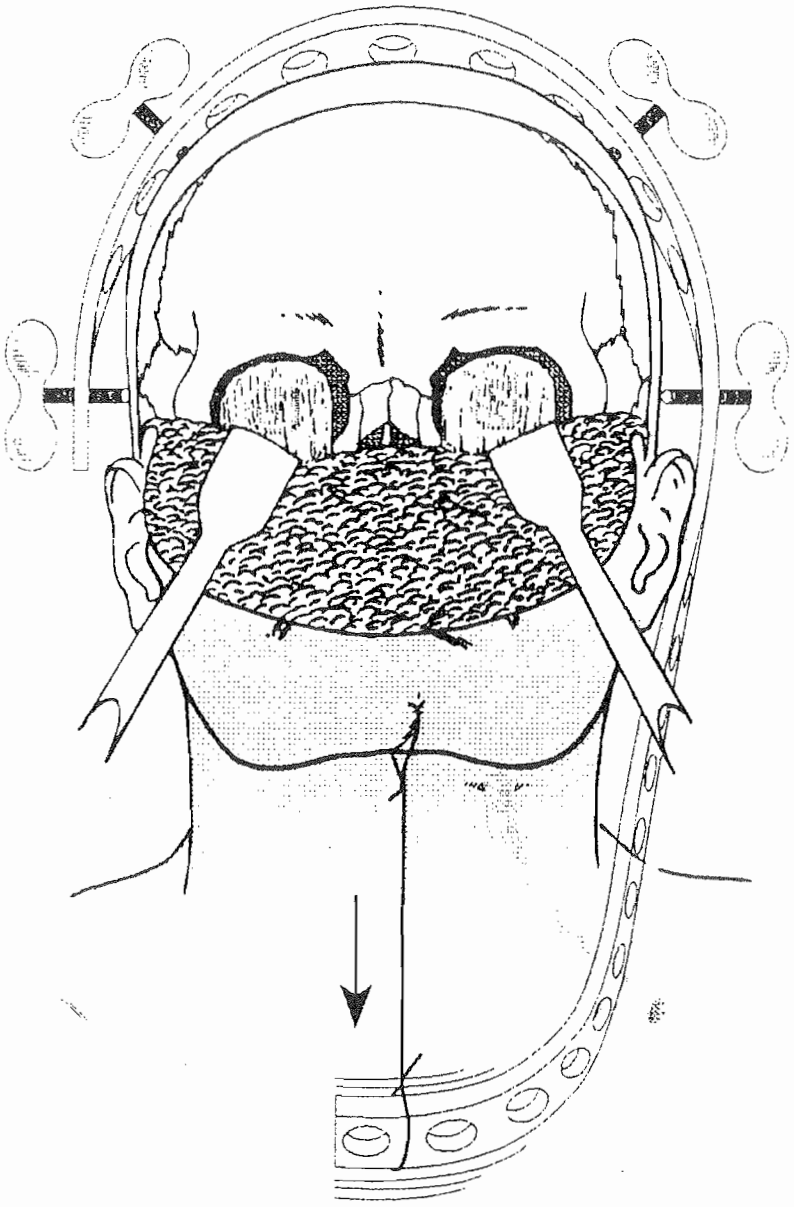


FIG.3

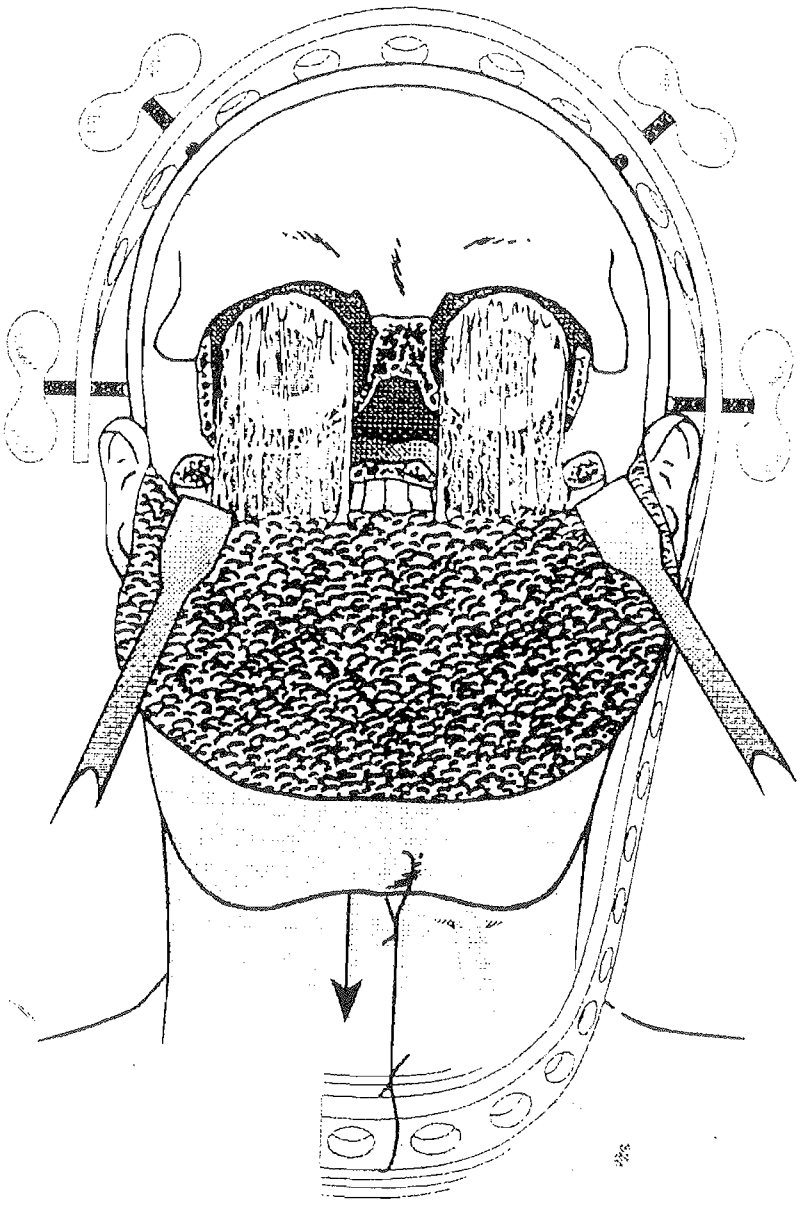


FIG.4

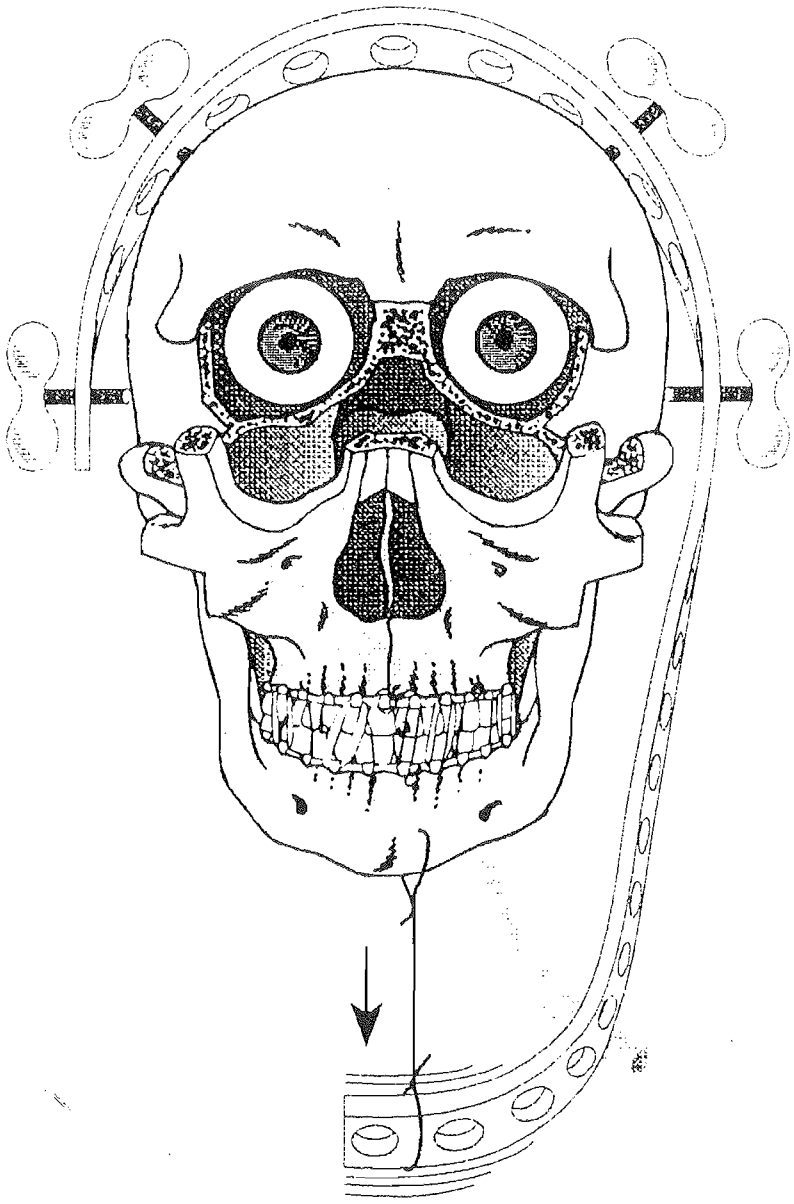


FIG.5

We have recently introduced the **retronasal intubation** which, in case it were necessary, allows to send the patient to the Intensive Care Department with the ventilation catheter in nasotracheal location, to which our Intensive Care Departments are more used nowadays. We have also descrived a new technique which allows to pass the nasotracheal tube to oral cavity or submental via. Finally, we have also developed a procedure for transposition of the nasotracheal tube to the oral cavity.

RETRONASAL INTUBATION
A new technique

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Introduction

Trying to avoid some of the inconveniences of nasal and oral intubation, tracheostomy and submental intubation, we have developed a new technique: **retronasal intubation.**

It binds the advantages of the nasal and oral intubation and, in certain occasions, it can avoid tracheostomy and submental intubation.

The technique we describe here has its main uses in the field of the oral and maxillofacial traumatology, ortognatic surgery, craniofacial surgery and in malformative and oncologic proccesses, as well as in the Intensive Care Units and in Anesthesiology and Reanimation, among others.

Technique

The patient is orally intubated with a ringed tube of the size we would use for a nasal intubation. Whenever needed along the surgical procedure, we introduce through the chosen narina a ringed Rusch catheter (rather than a cava catheter) of a diameter one unit below that of the orotracheal tube in the patient, pushing it to the oropharingeal cavity. Then, either manually or by some kind of clamp (a Magill clamp, of the kind used in anesthesiology, for instance), it is pulled out through the oral cavity. Immediately, the orotracheal tube is detached from the ventilator and attached to the distal end of the Rusch catheter, in such a way that both tubes are tightly joined to stand the progressive traction and slight turns that are necessary to pull them out through rynopharinx, choana, nasal fossa and narina, just like if it were a nasal intubation. All these handlings must take place with the cuff deflated, which must go through the same spaces as the

nasotracheal tube, of which it is a part. This way it is possible to change an oral intubation into nasal intubation without removing the tracheal tube from its conventional place in the trachea. This maneouvre enables us to work without the annoyance that would cause the tube if it were placed in the nasal region since the first moment. Besides, placing it in the nasal region from the mouth allows to perform intermaxillary blockades and as many intra or extraoral maneouvres as we consider adequate.

Discussion

It is an easy technique, and a riskless one if performed carefully, aspirating the oral cavity before deflating the cuff of the nasal tube. A supraglotic and glosopharyngeal region tampooning can be useful in this moment, and it is even possible to keep the ventilation of the patient through the Rusch catheter attached to the ventilator. Therefore, the procedure does not require quick movements or uncontrolled manoeuvres, as at no moment is the ventilation of the patient interrupted.

If the orotracheal tube is detached from the Rusch catheter when passing the choanal isthmus, the problem is a small one, as it is quite easy to recatch the tube from the mouth, and the procedure can be repeated as many times as necessary.

It will be useful to remember, though it has already been pointed above, that, in order to facilitate its attachment, the diameter of the ringed catheter should be one size immediately smaller than that of the orotracheal tube which is in the patient, and which will be pulled out through retronasal via.

If a cava catheter is used, which has usually a progresive diameter and a

thinner and more rigid end, the union to the orotracheal catheter is stronger. However, the cava catheters that we use are easily deformed when manipulated, which makes them less safe for these retronasal procedures, though, on the other hand, they allow to widen the choanal space.

In our experience, by the moment rather limited, we have not come across any damage of conchae or choanal or intranasal structure, though we admit that every procedure is developed most carefully.

The technique is indicated in those cases where nasal intubation is necessary at a certain moment of the surgical act (that every oral and maxillofacial surgeon knows when it is) and there is no desire of performing a tracheostomy or a submental intubation, or of changing an oral intubation into nasal intubation by removing the orotracheal catheter from its place in the trachea.

This technique may also have uses in the Intensive Care Units and in Anesthesia Units, whenever it is necessary to change the intraoral tube to the nasal cavity.

Conclusion

The Retronasal Intubation has its origin in orotracheal intubation, and is designed to avoid the risks that may result from tracheostomy or submental intubation, or from repetitive nasotracheal intubations. It allows to quit the previous orotracheal intubation as soon as it becomes inadequate for our work or for the comfort of the patient at the Intensive Care Unit.

Traumatologic and ortognatic surgery and the Intensive Care Units can take profit from Retronasal Intubation.

With the same atitude and technical media, we have turned a nasotracheal

intubation to orotracheal and also a submental intubation to orotracheal and then to nasotracheal, with all the advantage that may come from this in certain cases.

We believe that in these situations our procedure overpasses the possibilities of using the tracheal intubation fibroscope (a technique in which we are pioneers). Furthermore, with our technique of retronasal intubation and its modifications, the anesthesiologist is simply an onlooker and needs not invade our surgical field.

Acknowledgements

We wish to acknowledge the cooperation of the Units of Cardiovascular Surgery, Anesthesiology and Reanimation and Intensive Care, as well as that of the members of the Unit of Oral and Maxillofacial Surgery and of the Auxiliary Staff.

Summary

A new intubation technique is described. The retronasal intubation can avoid the tracheostomy and/or submental intubation and, besides, it improves the handling of the head and neck surgical field.

Keywords

Retronasal, tracheal intubation.

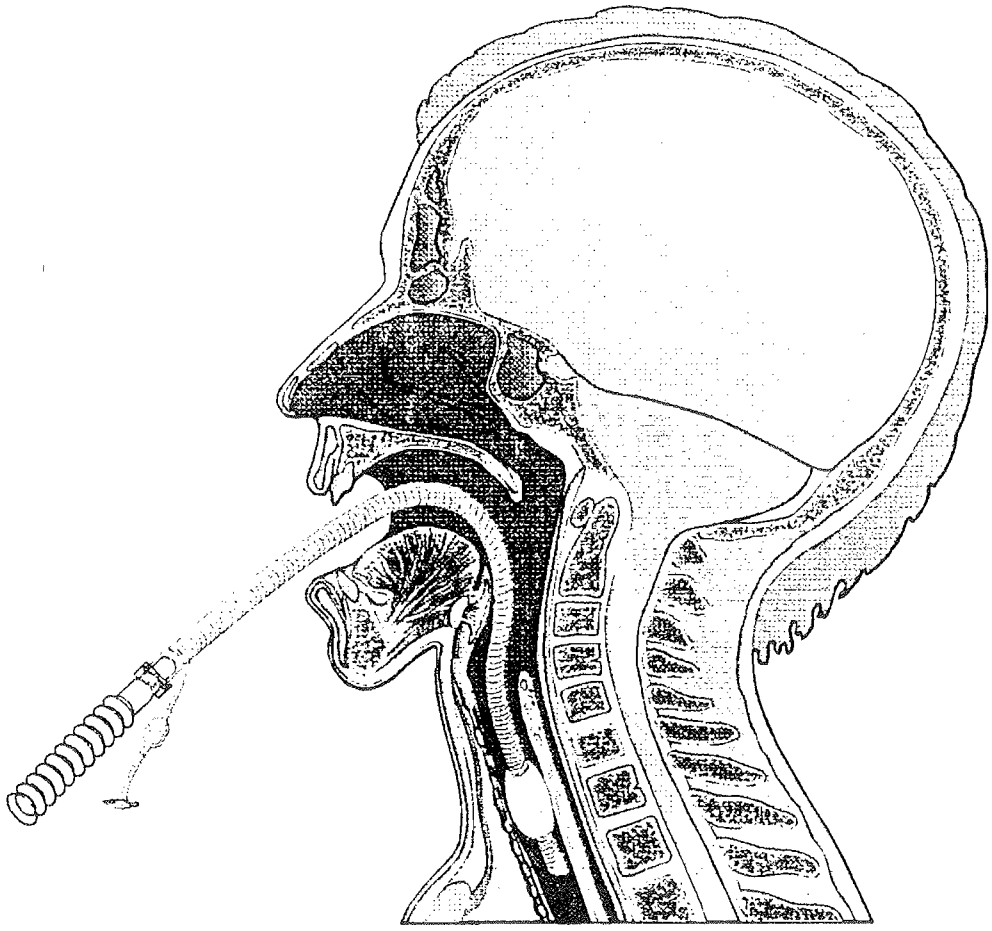

FIG.1

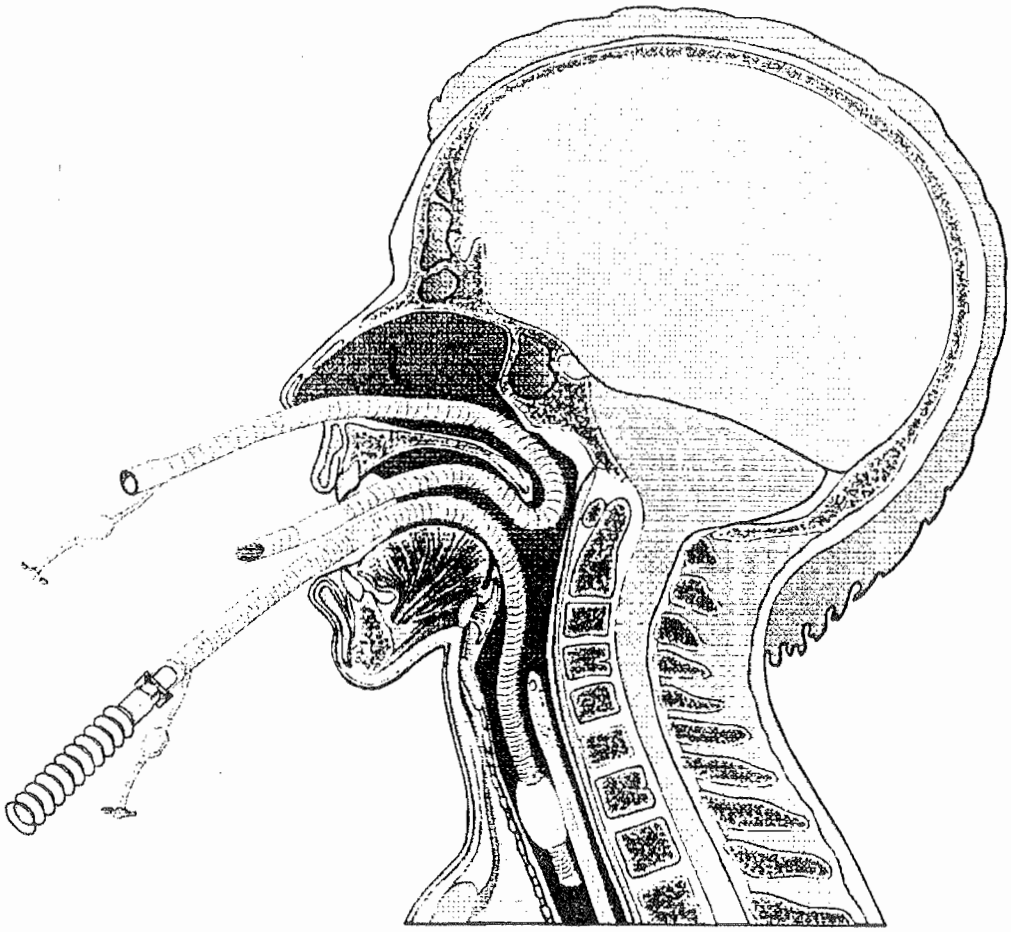

FIG.2

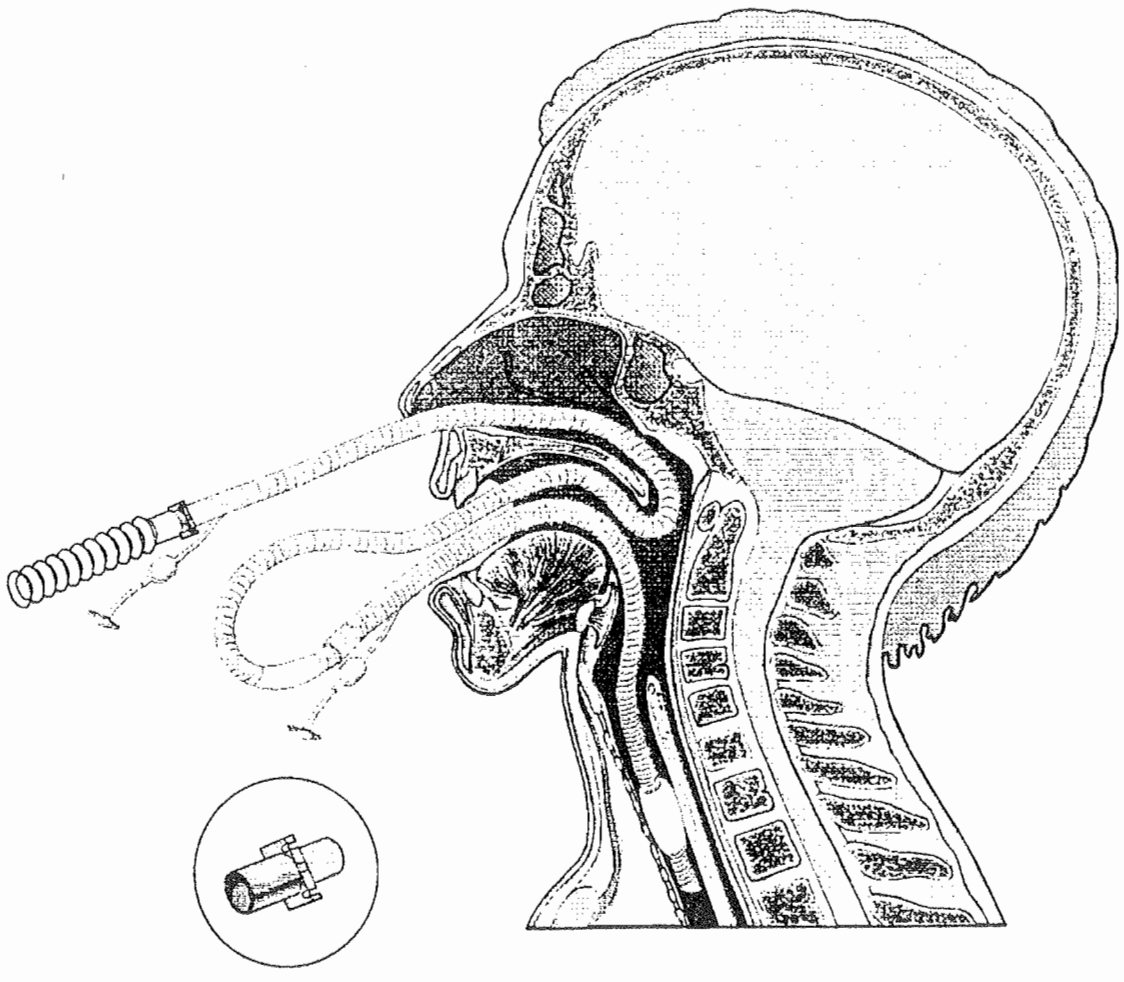

FIG.3

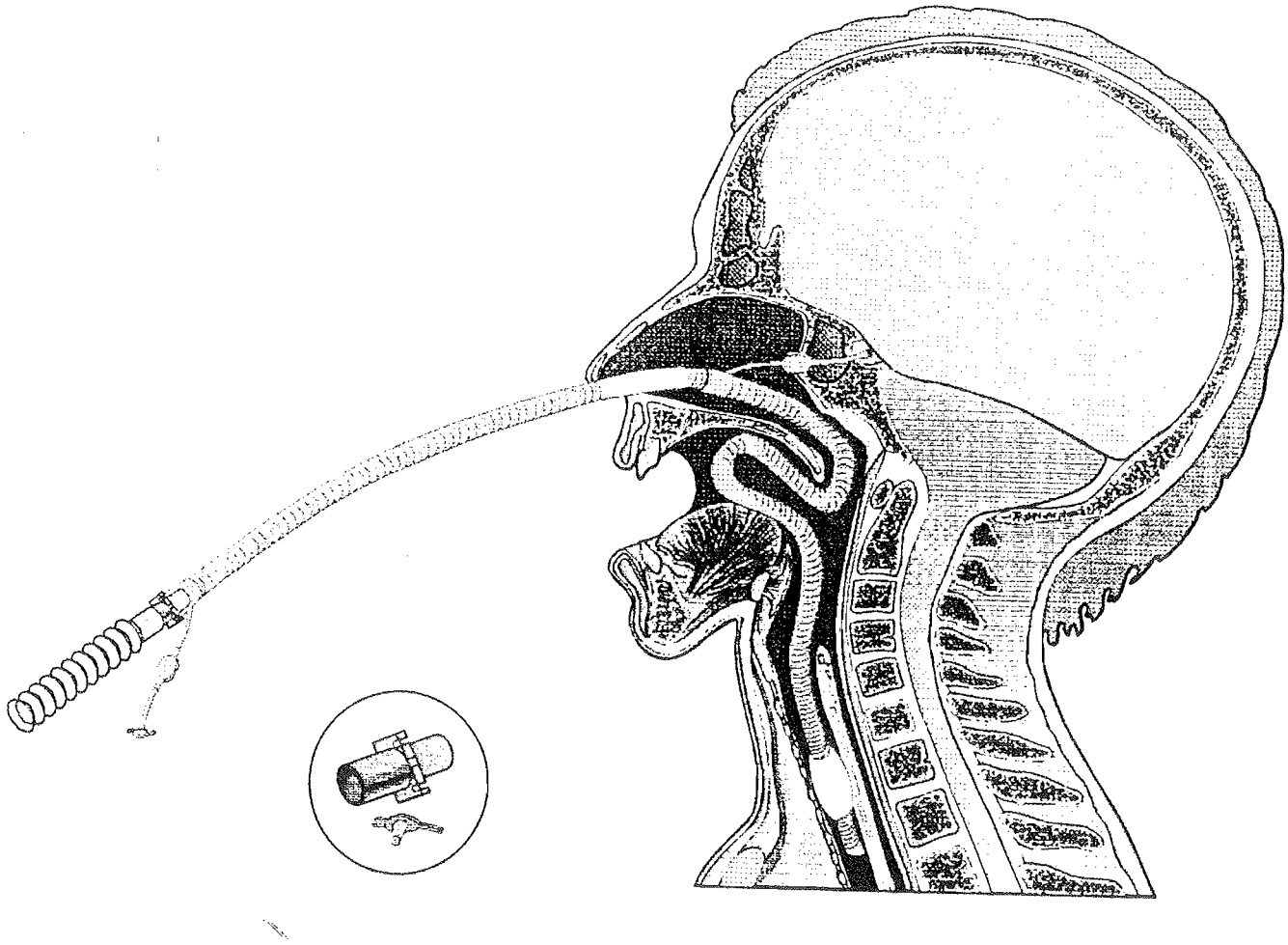

FIG.4

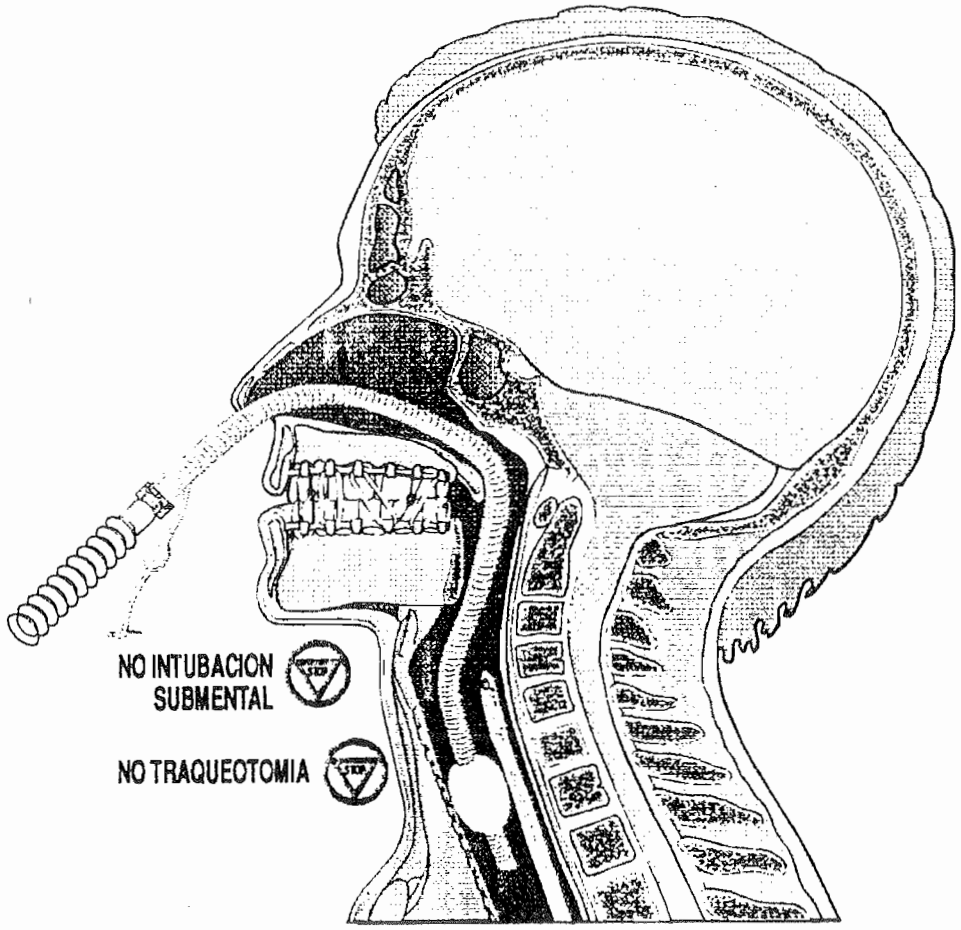

FIG.5

Fig. 1.-
The retronasal intubation begins with a conventional orotracheal intubation.

Fig. 2.-
The cava catheter is passed through the chosen carina towards the cavum and oropharinx to come out through the mouth.

Fig. 3.-
The cuff (balloon) stopper is released; the cava catheter, now with the ventilator connexion, is attached to the orotracheal tube.

Fig. 4.-
By pulling the cava catheter, the orotracheal tube is manually guided towards rinopharinx and coana, to place it in the corresponding nasal fossa together with the deflated cuff -the cuff stopper is previously cut to let the tube pass-.

Fig. 5.-
The orotracheal tube is now nasotracheal. The cuff can be inflated and ocluded with the cut stopper.

No submental intubation

No tracheostomy

UN NUEVO METODO DE TRANSFORMAR LA INTUBACION NASOTRAQUEAL A OROTRAQUEAL

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UN NUEVO MÉTODO DE TRANSFORMAR LA INTUBACION NASOTRAQUEAL A OROTRAQUEAL

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Introducción

A fin de evitar los inconvenientes que pueden significar, el cambio de la intubación nasotraqueal a oral, hemos desarrollado una nueva metodología que facilita esta maniobra, sin necesidad de retirar el tubo nasotraqueal de su ubicación traqueal y pasarlo a orotraqueal, sin que en ningún momento la ventilación del enfermo esté comprometida y por ello pueda verse en riesgos no siempre fáciles de controlar como puede suceder en otras técnicas.

Material y método

Empleamos símplemente para nuestra técnica un tubo anillado Rusch que se pueda ensamblar al tubo anillado Rusch, que el paciente lleva insertado en posición nasotraqueal y que va a ser objeto de sutransformación de nasotraqueal a orotraqueal.

Procedemos como sigue: ensamblamos el nuevo tubo de Rusch, al nasotraqueal del que es portador el enfermo, para ello bastará retirar los acoplamientos que unen el tubo nasotraqueal con el dispositivo de ventilación, ya que es en esa porción proximal del tubo nasotraqueal donde vamos a ensamblar como señalábamos la porción distal del nuevo tubo, que a su vez adaptara la conexión que lo ha de unir al equipo de anestesia o de ventilación.

Dispuestas así las cosas, el cirujano traccionara a nivel orofaríngeo del tubo nasotraqueal de forma tal que hará un bucle hacia la cavidad oral, al mismo tiempo irá acompañando los tubos acoplados hacia el interior de la fosa nasal, hasta el punto en que el bucle esté en posición extraoral y contenga el acoplamiento de ambos tubos y habiendo pasado ya el dispositivo de insuflado del tubo nasotraqueal que previamente había sido desinflado, aunque eso sí habríamos dispuesto previamente un pequeño taponamiento de venda de gasa humedecida en suero salino fisiológico en la región supraglótica, no sólo para evitar el paso de secreciones, sino tambien para facilitar la ventilación mientras el manguito estaba desinflado

que es sólo el tiempo que se ha tardado en pasar el tubo nasotraqueal al espacio extraoral, donde se vuelve a acoplar retirando previamente el tubo que ha servido para acompañar el nasotraqueal a la cavidad y espacio extraoral, las conexiones de acoplamiento al dispositivo de ventilación o de anestesia.

Durante la maniobra de deslizamiento del tubo nasotraqueal a la cavidad oral que hemos facilitado con el acoplamiento de un nuevo tubo anillado, es necesario prestar atención para que el tubo nasotraqueal no abandone la tráquea o que se pueda introducir hacia los bronquios principales. Por ello una vez realizada la maniobra o mientras esta dura el anestesiólogo deberá controlar con su estetoscopio si ventilan ambos pulmones. Una pinza tipo Magill puede ayudar a controlar el tubo nasotraqueal en la orofaríngе para evitar precisamente estos deslizamientos del tubo nasotraqueal incluso fuera de su posicionamiento traqueal, lo que sin duda significaría tener que reintubar al paciente, que es lo que precisamente hem os querido evitar con nuestra técnica.

En los gráficos que acompañamos hemos querido sintetizar de una manera que esperamos sea fácil de entender el procedimiento descrito.

Durante el desarrollo del procedimiento el anestesiólogo mantendrá una disposición espectante siendo responsabilidad del cirujano las maniobras descritas y todo ello con el fin de evitar contaminar el campo quirúrgico, otra cosa es, que el cambio del posicionamiento del tubo nasotraqueal a orotraqueal, se hiciera por los motivos que fuera en un paciente que se encuentra en la UVI y precisa este cambio o bien en la Sala de Recuperación del Servicio de Anestesia, ahí el anestesiólogo, con sus colaboradores se encargará de todo el procedimiento.

Conclusiones

Se trata de una técnica segura de fácil ejecución que no precisa medios que no sean los habituales en los ambientes de quirófano, Intensivos y de Anestesia.

Durante el desarrollo del procedimiento el paciente se encuentra en todo momento ventilado y si la maniobra se debe abortar por la causa que sea, el control en todo momento de la situación no debe plantear problemas, que no sean de fácil resolución.

Si fuera necesario y eso sí aseptizando el tubo proximalmente y en toda la longitud que se prevea va a contactar con el suelo de la boca y región submental.

La técnica resulta de utilidad no sólo en cirugía craneomaxilofacial, sino en otras especialidades de cabeza y cuello y en los ambientes de las Unidades de Vigilancia Intensiva y en las Salas de Anestesia y Reanimación.

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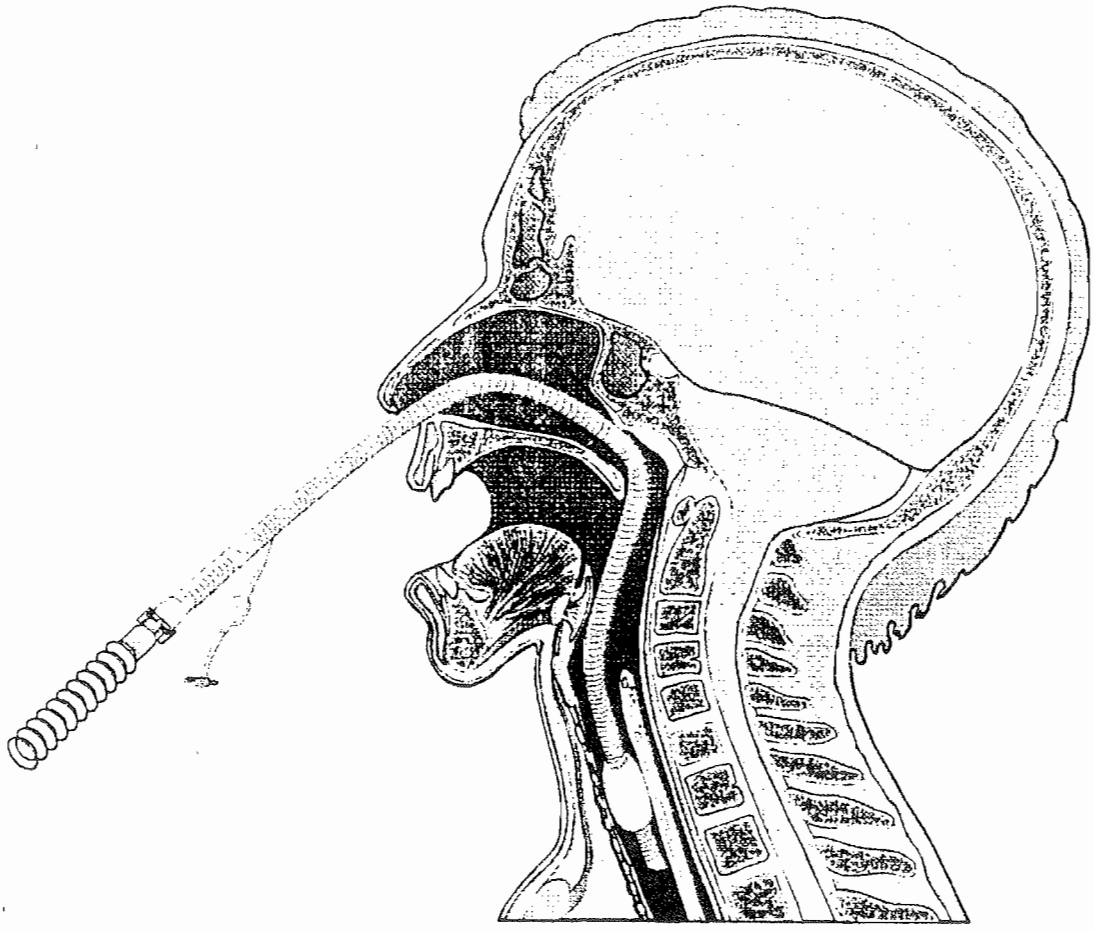

FIG.1

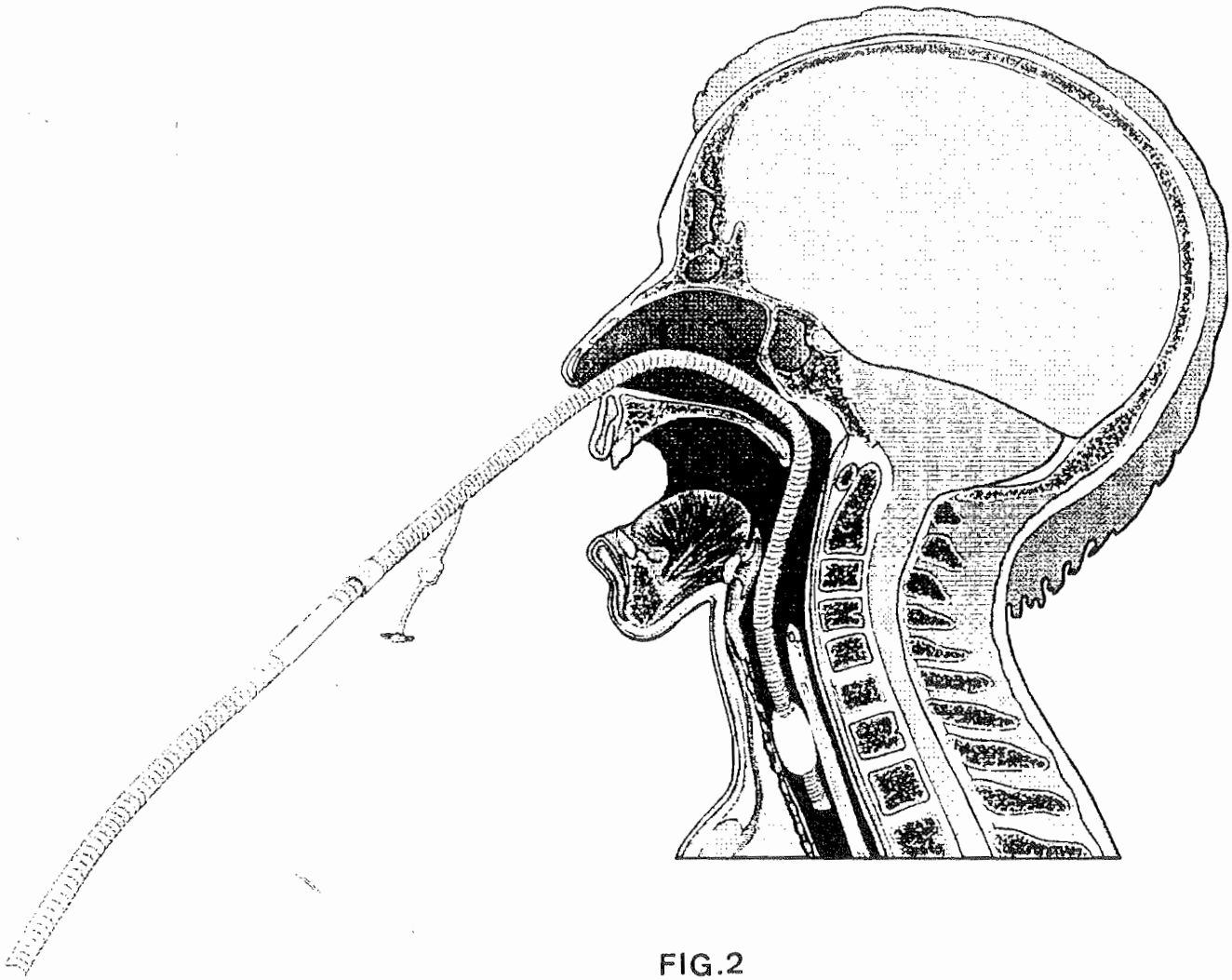

FIG.2

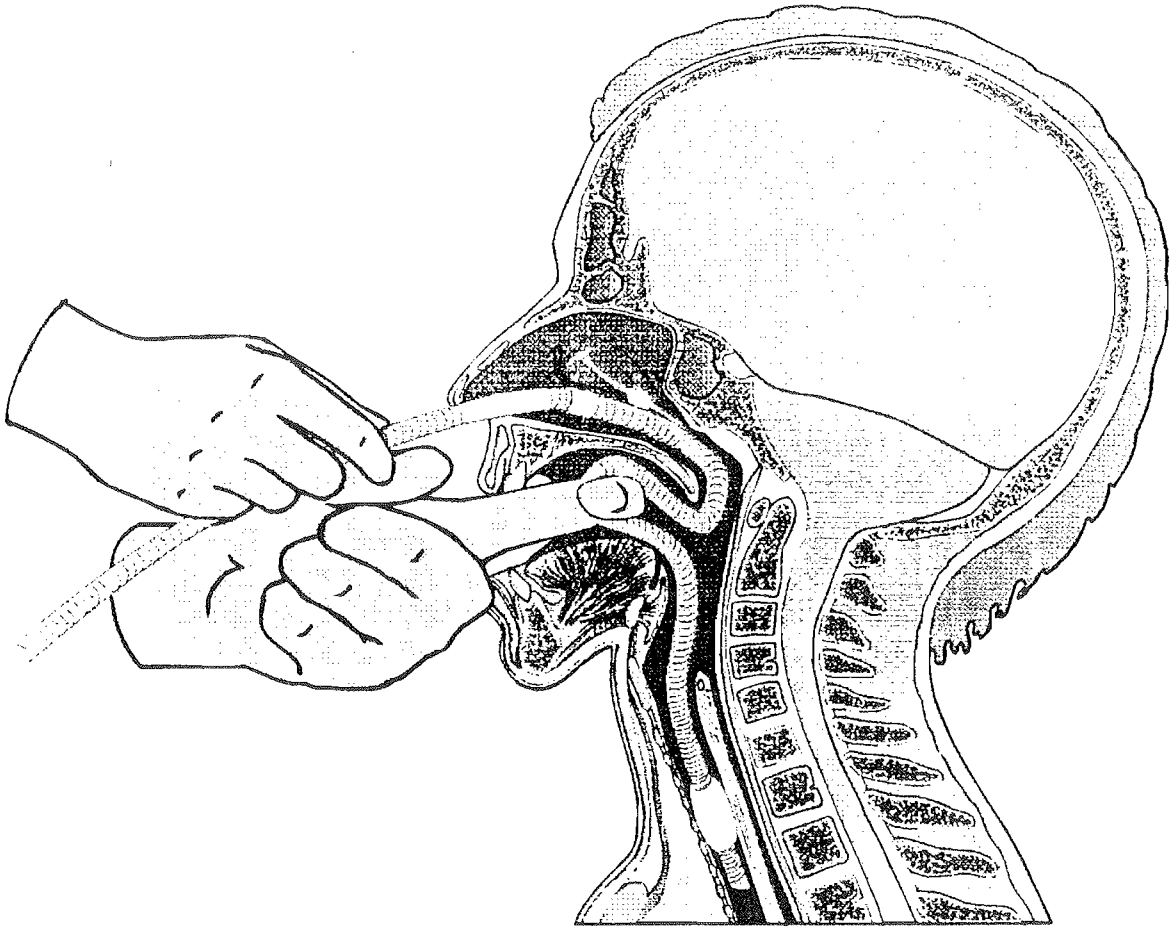

FIG.3

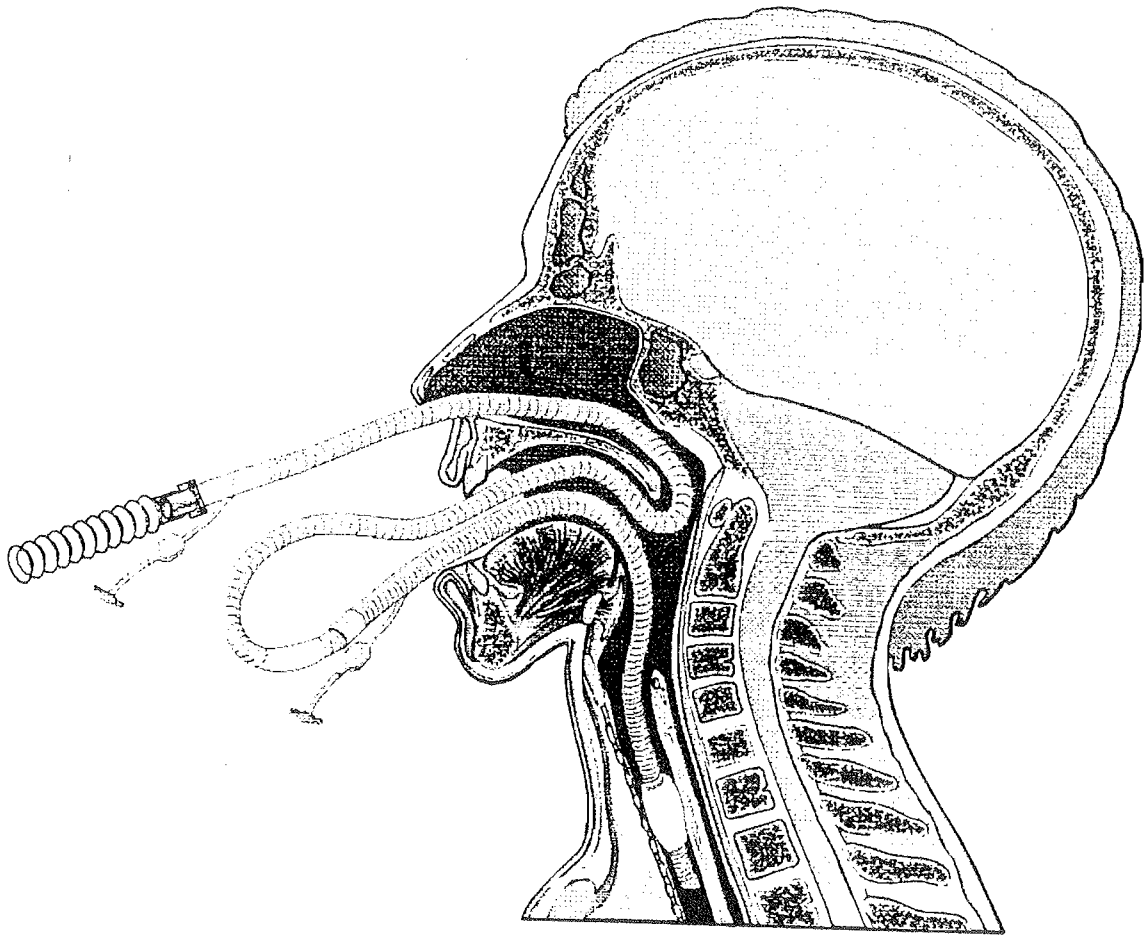

FIG.4

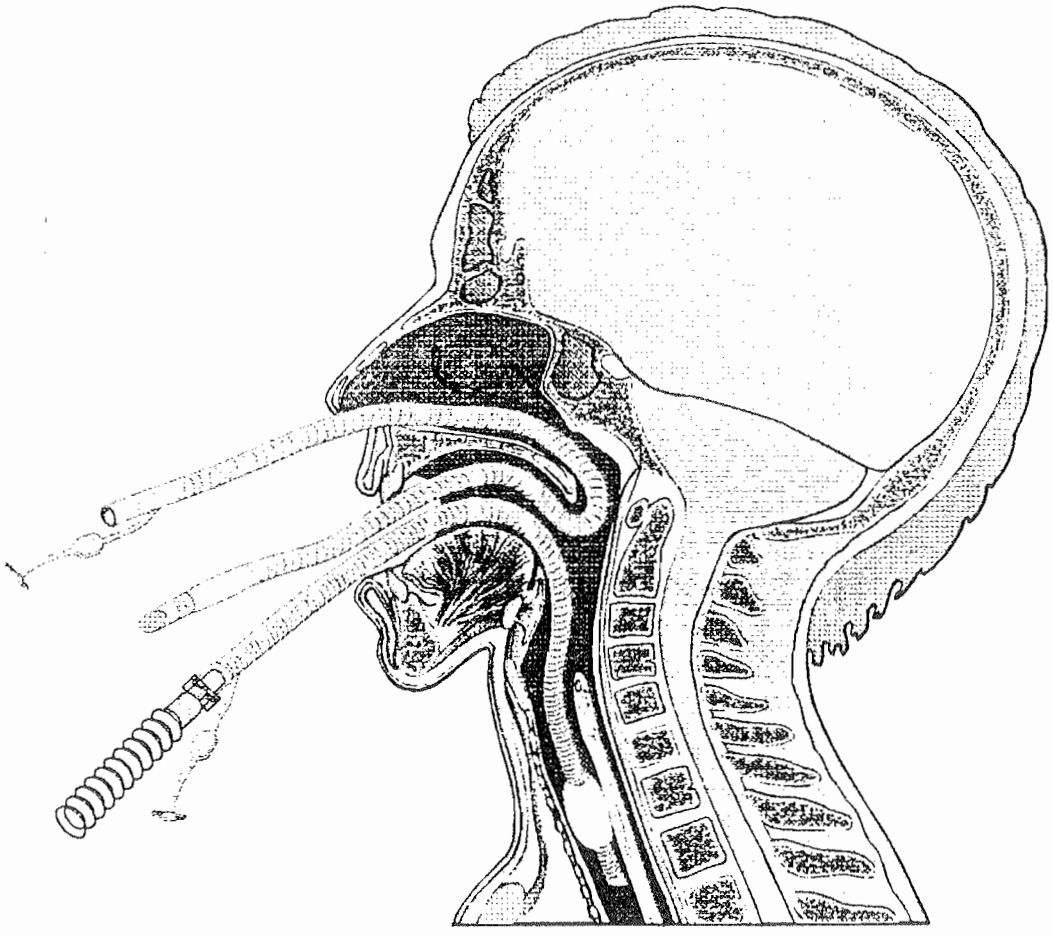

FIG.5

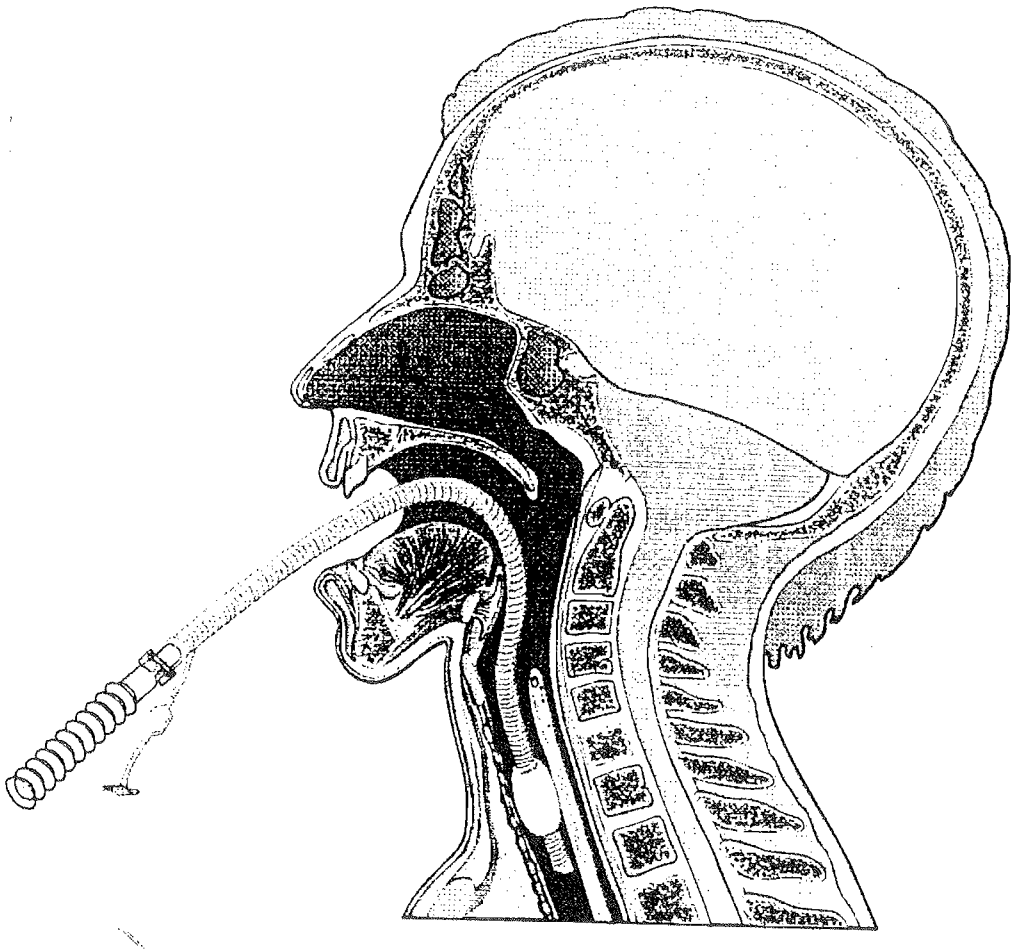

FIG.6

LARINGEAL MASK THROUGH RETRONASAL VIA

A technical alteration

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Introduction

The application of a laryngeal mask through the nasal via is quite a recent practice. It is combining the conventional laryngeal mask and our retronasal intubation technique that we have developed this technical modification for the use of the laryngeal mask through retronasal via.

Keywords: retronasal laryngeal mask.

It is with the aim of using the conventional laryngeal mask, until one specially designed for this purpose is available, that we have made this technical alteration.

Materials and Methods

To carry out this procedure it is only necessary, just like in our retronasal intubation technique, to have a ringed Rusch catheter, of a size that fits the nasal fossa. A laryngeal mask adequate to the patient will also be necessary.

Once the patient has been conveniently monitorized and prepared as if he/she were to be intubated through oral via, and still with spontaneous ventilation, the ringed catheter is passed through the chosen narina to the orofaryngeal cavity, where it is pulled out of the mouth with a Magill clamp (it may be helpful to have previously set an intermaxillary cuneus to make easier this operation).

Then, the proximal end of the ventilation tube of the laryngeal mask is attached to the distal extraoral end of the ringed tube, and we push carefully the mask towards the faryngeal region and cavum; at this moment the cuff is deflated.

The next step is to pull the ringed catheter out through the narina in order to carry

there the tube of the laryngeal mask. As this tube could be too short to overpass the nasal fossa, the ventilator dispositive can be attached to our ringed Rusch catheter (we hope a laryngeal mask, with a ventilation tube more adequate for passing through retronasal via, will be produced).

Inmediately the cuff, which is already placed at the glosofaryngeal cavity, is inflated and carried with a firm approaching movement to the supraglotic region, continuing then the procedure in the conventional way for the laryngeal mask.

Once the terapeutic action is finished, the laryngeal mask is deflated and pulled out, either manualy or with a Magill clamp; obviously, before extracting the laryngeal mask, the Rusch catheter must have been dettached. In any case, we must recognise that not all the steps are the same in every patient and circumstance, and therefore we only point out the procedure in a general way. Each specialist must take and alter it according to his/her own mind and experience. In case it were necessary, if it were impossible to insert the laryngeal mask, the Rusch ringed catheter can be carried into the trachea in the conventional way.

Discussion

With our technical modification we intend to take profit, in very special cases, of our retronasal intubation technique for the use of the laryngeal mask in this way.

We annex the graphic sequence of the technique for the retronasal use of the laryngeal mask.

Our acknowledgement to the Services of Anaesthesiology and Reanimation and Intensive Care of the Hospital Miguel Servèt of Zaragoza.

For the performance of this technique it is necessary to modify the tube of the laryngeal mask, in such a way that it suits the diameter of chonanas, nasal fossa and narina;

of course, it must also be made flexible, ringed and, at the same time, quite strong.

Our first cases were carried out with a ringed cava catheter of the type used in cardiac surgery for extracorporeal techniques, but more advantage can be obtained from the use of the conventional Rusch ringed catheter.

FIGURE 1: The ringed Rusch catheter has been pushed through the chosen narina into cavum and hypofaryngeal region, and then pulled out of the oral cavity with a Magill Clamp or similar.

FIGURE 2: The laryngeal mask is attached to the ringed catheter.

FIGURE 3: The ringed catheter is gradually pulled out through the nose, while the laryngeal mask, deflated, is pushed manually towards the oral cavity.

FIGURE 4: The laryngeal mask, deflated, is already placed in the oral cavity.

FIGURE 5: Once the laryngeal mask has reached the hipofaryngeal region, it is inflated, and then two movements must be made: on a first step we pull the tube of the laryngeal mask, so that it is slightly carried to the rhinofaryngeal region; on the second step the mask is pushed towards the supraglotic region.

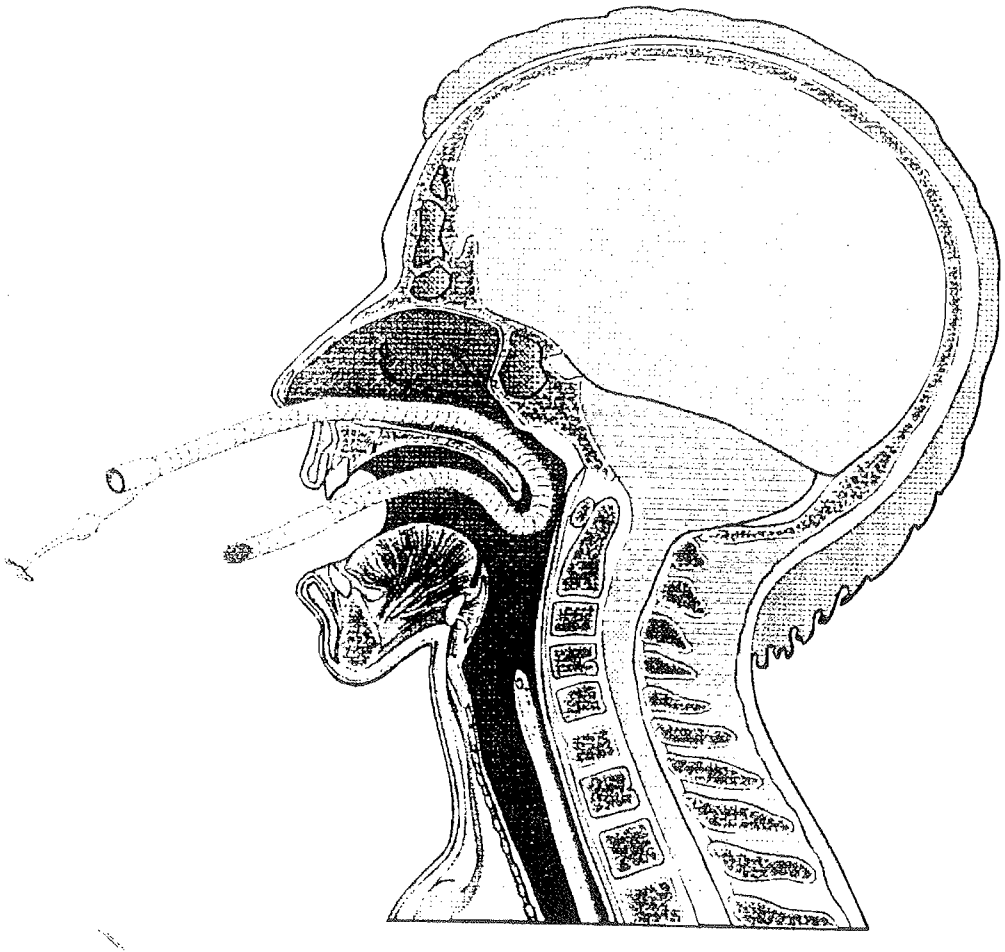

FIG.1

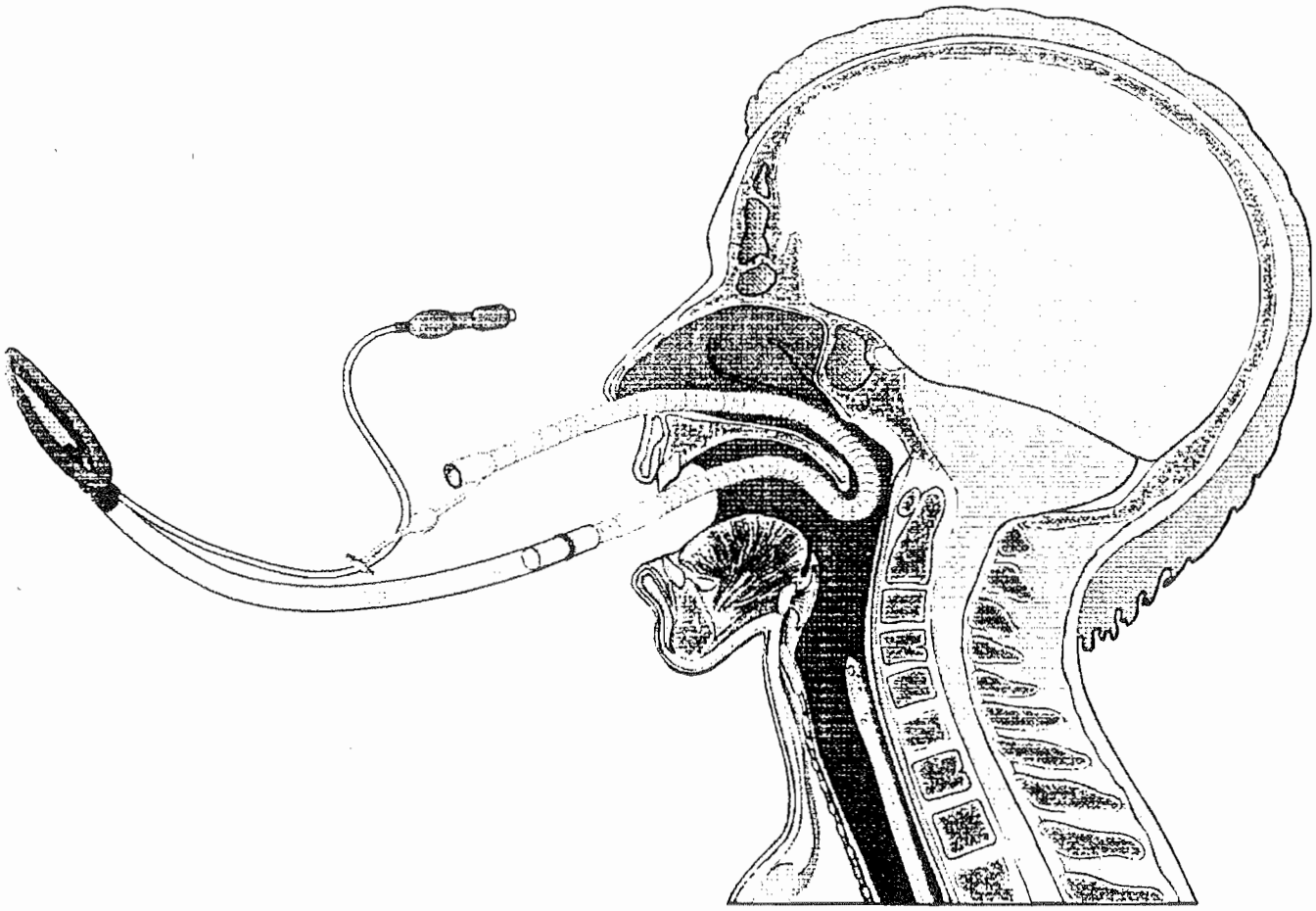

FIG. 2

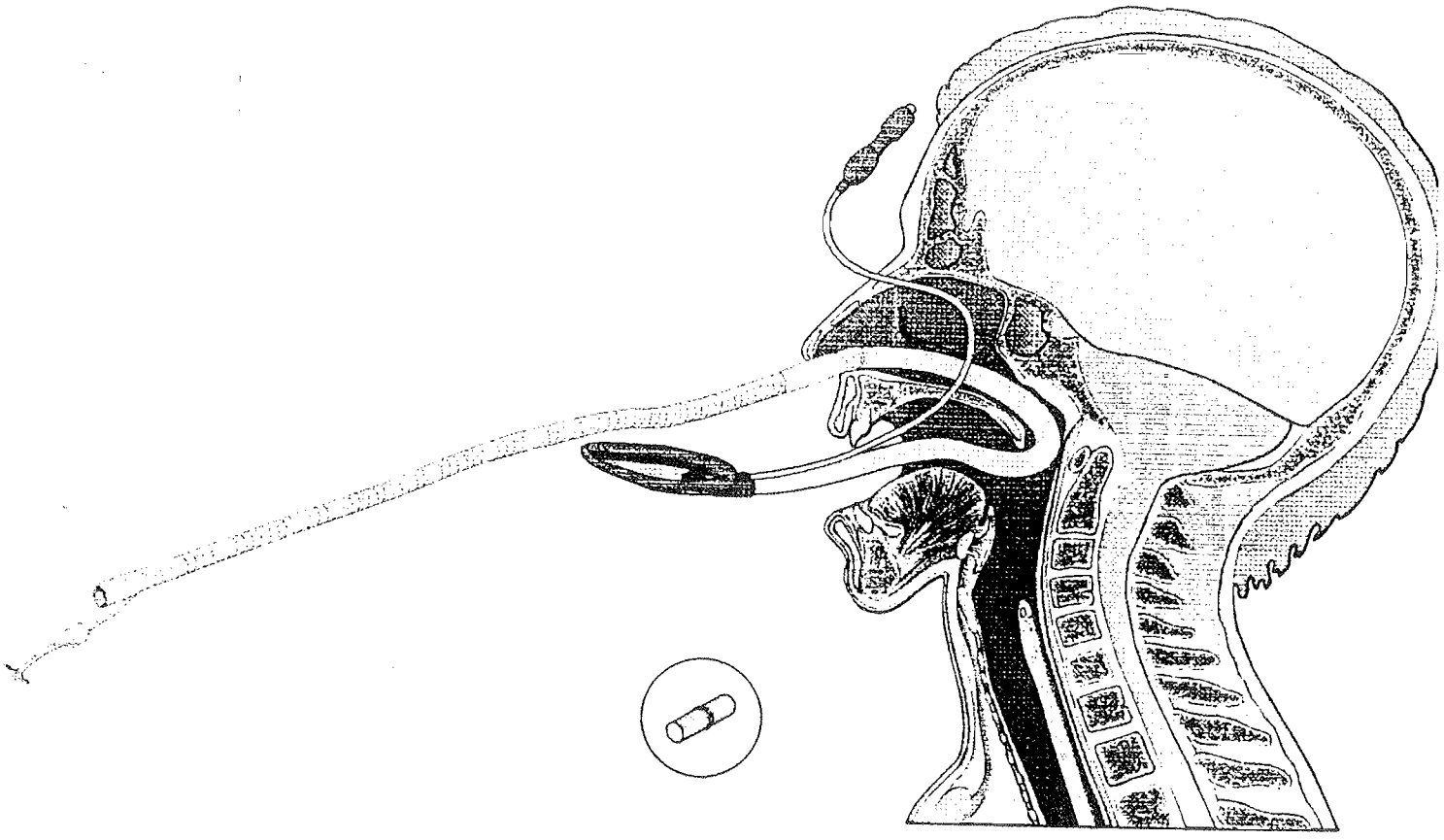

FIG.3

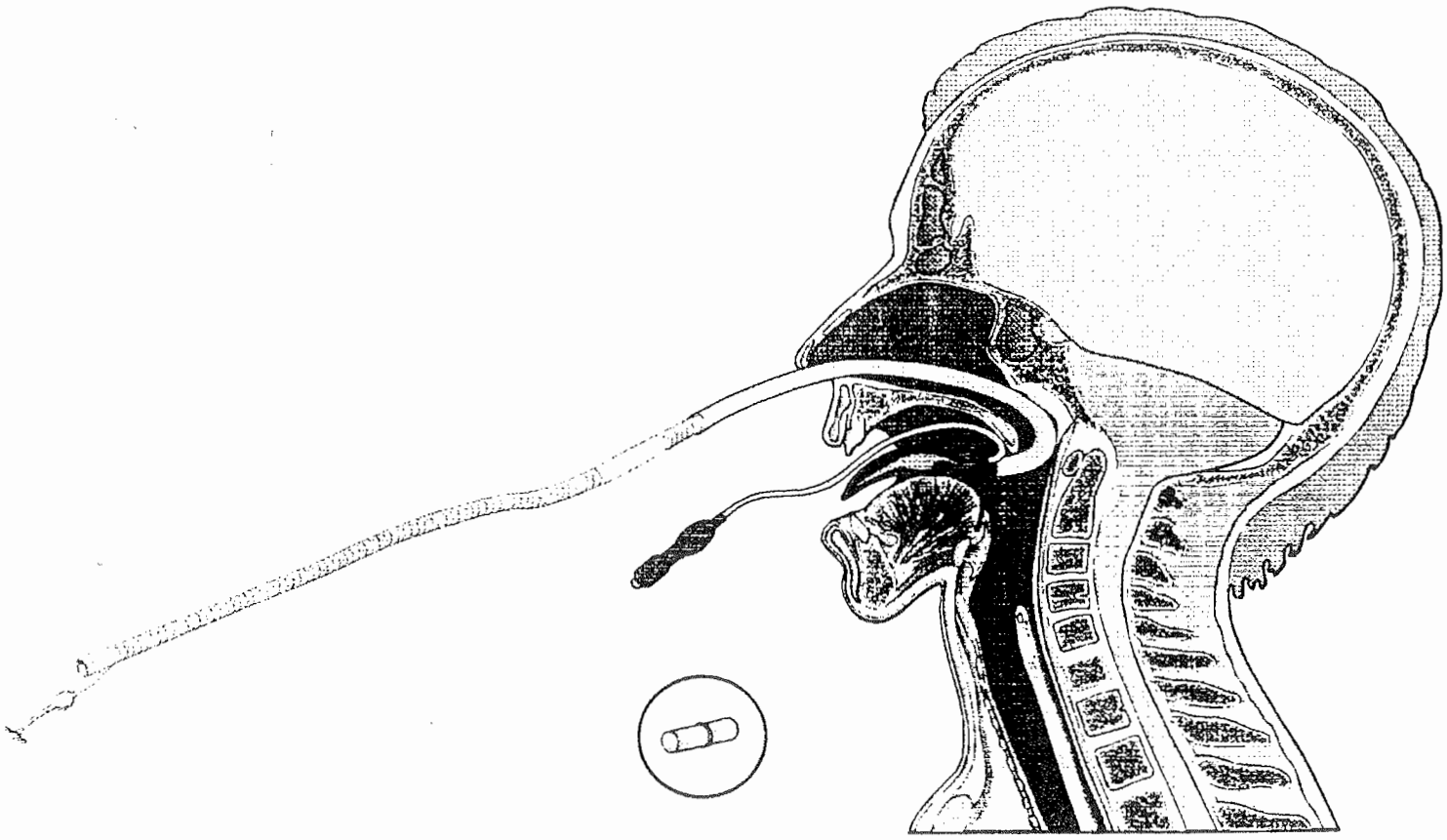

FIG.4

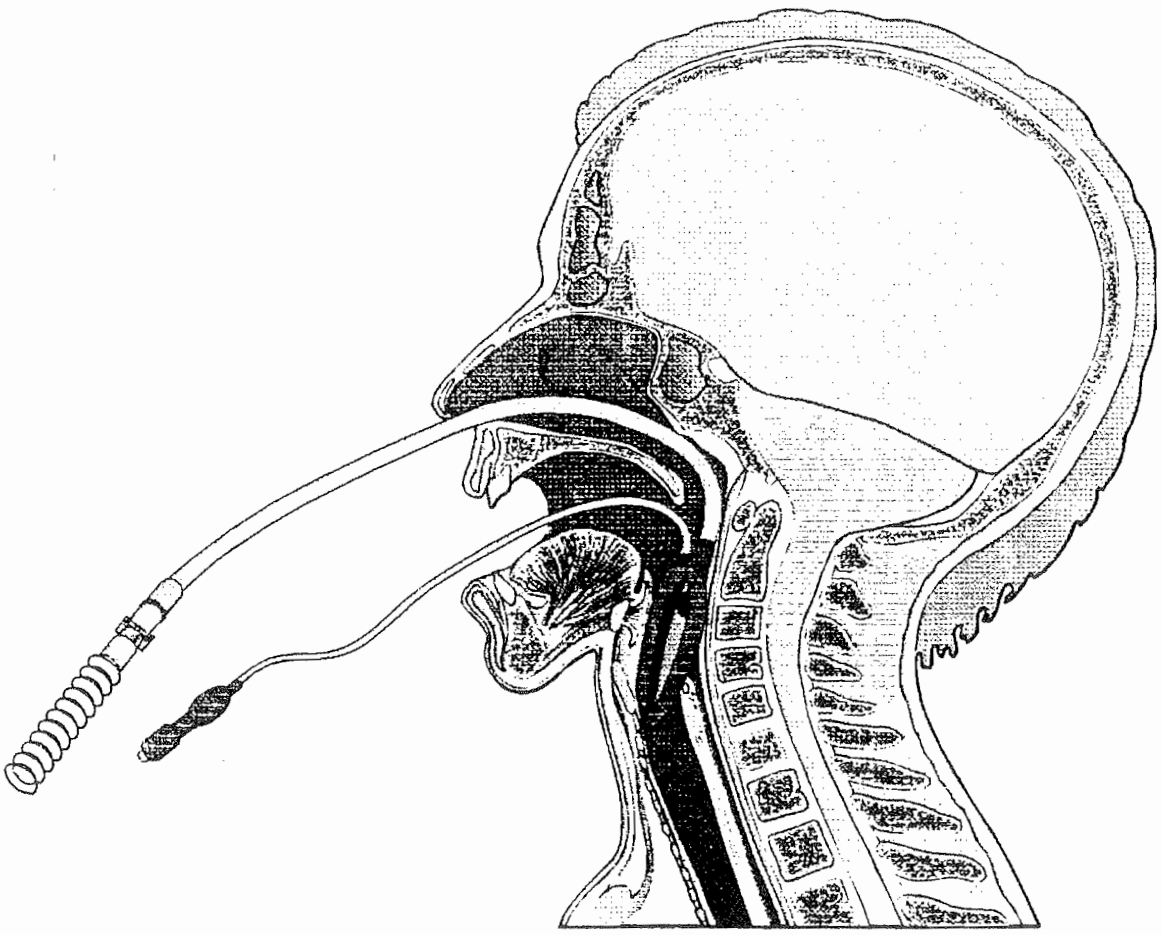

FIG.5