Zygomatic Arch Access Osteotomy

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Introduction: Access surgery is becoming popular in various surgical fields. Neuro-Surgeons in particular recognize that facial osteotomies can provide access to the cranial base⁶. The oral and maxillofacial surgeons, by virtue of their training and expertise in orthognathic surgeries, are in an advantageous position to perform these access techniques.

Almost all methods of transfacial access to the skull base involve the elevation of osteoplastic flaps. The skull base is divided into one central and two lateral compartments. The lateral compartments are further divided into anterior, middle and posterior regions⁶. (Fig.1) The central skull base can be accessed by modified maxillary and mandibular

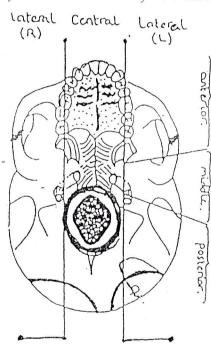


Fig. 1 - Central & lateral compartments of the skull base

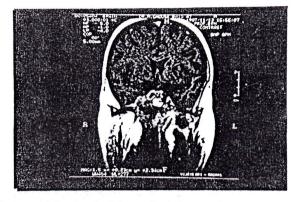


Fig. 2 - MRI showing the lesion at the right apex of peterous temporal bone

osteotomies. The access to the lateral regions is made easier with basic techniques described to expose and reconstruct the temporomandibular joint.

In this paper a case is reported wherein a temporal approach and zygomatic arch osteotomy was performed to access the apex of the petrous part of the temporal bone, to facilitate a microscope aided neuro surgical procedure.

Case Report: A 48 year old male patient with diagnosis of neurofibroma at the apex of the petrous temporal bone was referred by the neurosurgery department for an access procedure to perform excision. The CT * MRI (Fig.2) were reviewed and zygomatic arch osteotomy was decided as an ideal access technique for the procedure.

Technique: Through an Alkayat Bramley incision extending to the preauricular region on the right side of the face, a fasico cutaneous flap was raised, exposing the temporalis fascia. The zygomatic arch

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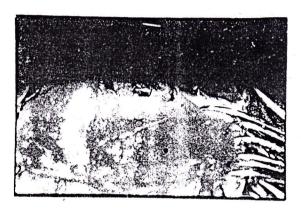


Fig. 3 A - Exposed Zygomatic Arch

(Fig.3) was exposed from the glenoid tubercle to the body of the zygomatic bone, after reflecting the facial nerve branch along with the superficial fascia. The osteotomy cuts were made with a thin bur at the root of the arch and near the body. The osteotomized arch was reflected from the temporal bone in an inverted 'U' shape pedicled inferiorly, preserving the vessels on either side. The access was open to the petrous temporal region (Fig.4). After completion of the neurosurgical procedure the muscle was sutured back, the osteotomized arch was replaced in the previous position and stabilised with 1-0 vicryl sutures, (Fig.5) wire or plate fixation would have produced scattering during post operative radiological procedures. The wound was closed in layers.

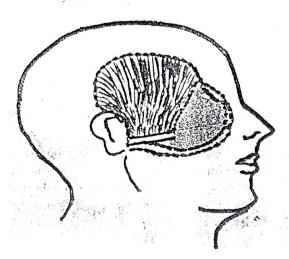


Fig. 3 B - Illustration



Fig. 4 - A. Retracted Zygomatic Arch and Temporalis Muscle

Discussion: Access osteotomies are nowadays primarily directed towards benign lesions. The selection of a particular technique depends on determining the accurate location of the lesion with the help of radiological or endoscopic techniques (fig.6).

A significant advance in the lateral approach to the skull base was made by FISCH and later developed and popularised by FIUJITSU and KUWABARA in 1985¹. FISCH⁹ proposed three approaches name A, B & C types for the posterior, middle and anterior regions of the lateral compartment of the skull base respectively. Trans zygomatic osteotomies are performed with 'B' type. The external acoustic meatus and the lateral orbital rim are resected with the A

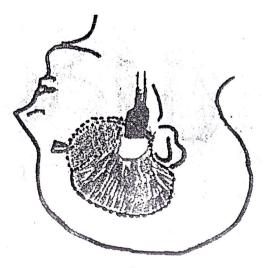


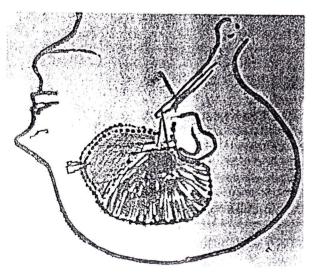
Fig. 4 B - Illustration



Fig. 5 - A. Relocation of the arch after suturing back the temporalis muscle

& C types. The temporal bone osteotomy is performed in conjunction with any of these types as per the requirement of the exposure.

The modified zygomatic arch osteotomy described in this paper was published by PITELLI as a cadaveric and clinical study in 1986². This technique avoids wide exposure and extensive osteotomies. The Alkayat Bramley incision has less morbidity and adequate exposure compared to the bicoronoal incision. Avoiding total zygomatic bone disarticulation prevents later facial asymmetery and reduces damage to the zygomatico temporal and zygomatico facial branches of the facial nerve. As



Lig. 5 - B. Illustration

only a portion of the temporalis muscle was raised from the temporal bone, post operative temporalis muscle atrophy is avoided.

The advantages of this technique include

- 1. Improved access to the lesion
- 2. Minimal brain retraction
- 3. Protection to brain and neuro vascular structures
- 4. Access to adjacent anatomical compartments
- 5. Minimal Morbidity
- 6. Minimal additional operative time.

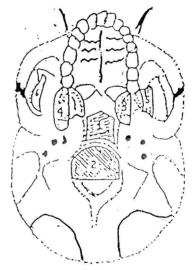


Fig. 6 - 1. Chous 2. Cervical Spine 3. Pterygoid space/medial 4. Pterygoid space/lateral 5. Infra temporal fossa 6. Middle cranial fossa

The zygomatic arch osteotomy procedure facilitates the access to the middle and medial region of the infra temporal fossa. The other modifications provide access to the various regions of the lateral compartment, the infra temporal fossa, retromaxillary region, posterior orbital region and the ptreygomaxillary region of the skull base. In general, these techniques have acceptable morbidiy, minimal scarring and preserve satisfactory post operative function.

The possible complications are damage to the zygomatic branch and the trunk of the 7th nerve, atrophy of the temporalis muscle, facial asymmetry, re-

duced mouth opening and temporary reduced chewing power of the osteotomized side.

References

- Kaxuhiko Fujitsu, M.D., and Takeo Kuwabara, M.D. Zygomatic approach for lesions in the interpeduncular cistern - J Neurosurg 1985; 62: 340-343,
- Domingos Pitelli, M.D., Gilberto G.M. Almeida, M.D., Edison J. Nakagawa, M.D., Antonio J.T. Marchese, M.D., and Nilton Domingos Cabral M.D. Basilar aneurysm surgery: The subtemporal approach with section of the zygomatic arch - Neurosurgery 1986; 18: 125-128.
- Bruce Mickey M.D., Lanny Close M.D., Steven Schaeffer M.D., and Duke Samson M.D. J. A combined frontolemporal and lateral infratemporal fossa approach to the skull base - Neurosurgery 1988; 68: 678-683.
- Glenn Neil-Dwyer M.S., F.R.C.S., Michael Sharr M.R.C.P., F.R.C.S., Richard Haskell M.R.C.P. F.D.S., David Currie F.R.C.S. and Massoud Hosseini F.R.C.S., F.D.S. Zygomaticotemporal approach to the basis cranii and basillar artery - Neurosurgery 1988; 23: 20-22.

- 5. D. Uttley F.R.C.S., D.J.Archer F.R.C.S., H.T. Marsh F.R.C.S. and B.A. Bell F.R.C.S. Improved access to lesions of the central skull base by mobilization of the zygoma: Experience with 54 cases Neurosurgery 1991; 28: 99-104.
- Peter David Grime, Richard Haskell, Iain Robertson, Richard Gullan Transfacial access for neurosurgical procedures: An extended role for the Maxillofacial surgeon - Int. J. Oral Maxillofac. Surg. 1991; 20: 285-290.
- 7. Kiyonoby Ikeda M.D., Junkoh Yamashita M.D., Masaaki Hashimoto M.D., and Kazuya Futami M.D. Orbitozygomatic temporopolar approach for a high basilar tip aneurysm associated with a short intracranialinternal carotid artery: A new surgical approach Neurosurgery 1991; 28: 105-110.
- S. Honeybul, G. Neil-Dwyer, B.T. Evans, D.A. Lang -The transzygomatic approach: An anatomical study -Br. J Oral Maxillofac. Surg. 1997; 35:334-340
- 9. Laligam N. Sekhar; Ivop Janecka Surgery of cranial based tumours

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