FRONTOLATERAL KEY HOLE CRANIOTOMY APPROACH TO ANTERIOR CRANIAL BASE

Moustafa Mohey Eldin Hafez, M.D., Tarek Hassan Abdel Bary, M.D., Adel Saad Ismail M.D., Mansour Abdel Mageed Mohammed, M.B.B.Ch, M.Sc.
Department of Neurosurgery, Zagazig University

ABSTRACT

Objective: To evaluate the Frontolateral key hole craniotomy as an alternative minimal invasive approach to anterior cranial base lesions.

Methods: Between September 2009 and september 2012 , 24 selected patient with anterior cranial base lesions, included (14 pituitary macroadenoma, 4 planum sphenoidal meningeoma, 2 tuberculum sellae meningeoma, 2 craniopharyngioma, 1 suprasellar germinoma, 1 ganglioneuroma). Tumor size ranged from 15- 50 mm, with mean size 30.9±8.7mm. All patients underwent surgical intervention in the form of minimal invasive frontolateral keyhole craniotomy either supra-orbital; n= 12 patients or transsupra-orbital; n= 12 patients. The study included 13 males, and 11 females, age ranged between 8 -70 years (mean age 40.3ys). Follow up period ranged between 6 – 36 months. All patients underwent preoperative CT brain, and MRI brain . Postoperatively, all patients underwent CT and/or MRI brain.

Results: 15 patients (62.5%) reported visual improvement after surgery, 8 patients (33.3%) reported no change in visual function and 1 patient (4.2%) died early postoperative. Gross total removal in 4 patients (16.7%); in 12 patients (50%) removal near total (more than 90%of the tumor); 7 patients (29.1%) removal was subtotal (from 70-90% of the tumor); and in one patient (4.2%) removal was partial (less than 70% of the tumor).

Conclusion: Then Frontolateral key hole craniotomy is applicable minicraniotomy as an alternative minimal invasive approach to anterior cranial base lesions. It offers equal surgical possibilities with minimal brain retraction, allowing quick and minimally invasive access to the tumor with less brain exposure, and comparable results to standard approaches. In addition, the small skin incision, and small craniotomy result in a pleasing cosmetic outcome.

Key words: Supraorbital Keyhole approach, eyebrow incision, minimally invasive skull base surgery, superciliary approach.

INTRODUCTION

Different surgical approaches for anterior skull base lesions have been performed since a longtime. All these classic approaches involved a wide exposure, more tissue destruction, wide cerebral cortex exposure, predisposed for cortical injury and cerebral infarction, increasing morbidity and mortality[1,12]. To overcome these problems, the transciliary keyhole or frontolateral keyhole approach was developed[9-22]. Instead of a large craniotomy (frontotemporal), a small craniotomy was used under the concept of keyhole surgery as of Perneczky[25]. This approach claimed to be minimally invasive for access to the anterior cranial fossa including the sellar and parasellar areas. Potential advantages of this approach reduced operative morbidity of those described above , however, there were also some limitations of this eyebrow keyhole approach[19] In this study we evaluate the Frontolateral key hole craniotomy as an alternative minimal invasive approach to anterior cranial base lesions.

PATIENTS & METHODS

Between September 2009 and September 2012, 24 selected patients with anterior skull base lesions, included (14 pituitary macroadenoma, 4 planum sphenoidal meningeoma, 2 tuberculum sellae meningeoma, 2 craniopharyngioma, 1 suprasellar germinoma, 1 ganglioneuroma). Tumor size ranged from 15- 50 mm, with mean size 30.9±8.7mm, and patients presented with (visual disturbance 87.5%, headache 70.8%, endocrine disturbances 8.3% unilateral trigeminal pain 4.2% abducent palsy 4.2% unilateral proptosis 4.2%). All patients underwent surgical intervention in the form of minimal invasive frontolateral keyhole craniotomy either supra-orbital; n= 12 patients or transsupra-orbital; n= 12 patients. The study included 13 males, and 11 females, age ranged between 8 -70 years (mean age 40.3ys). Follow up period ranged between 6 – 36 months. All patients underwent preoperative CT brain, and MRI brain . Postoperatively, all patients underwent CT and/or MRI brain.

Table (1):Anterior cranial base lesions operated

Histopathology	NO
Pituitary macroadenoma	14
Planum sphenoidal meningeoma	4
Ttuberculum sellae meningeoma	2
Craniopharyngioma	2
Suprasellar germinoma	1
Ganglioneuroma	1
Total	24

SURGICAL TECHNIQUE

Positioning: After induction of endotracheal anesthesia, the patient is placed in a supine position with the head fixed in a three-pin Mayfield headholder and elevated approximately 15 degrees .Thereafter, the head is rotated to the side opposite the planned craniotomy, for lesions of the lateral suprasellar and retrosellar area, 20 degrees of head rotation has been found to be sufficient. The anterior suprasellar region requires a rotation of 30 degrees. The neck of the patient is retroflected, resulting in an approximate 20 degree angle between the plane of the anterior cranial base and the vertical plane of the axis.

Incision: Eye brow skin incision in the superior margin of the eye brow, extends according to the design and the size of the craniotomy needed, mostly extending medial to the supraorbital notch or foramen, with dissection and mobilization of the supraorbital neurovascular bundle medially. Laterally, it extends with the eye brow, or within 1cm lateral to it.

Approach: 23 patients were operated from right side, 1 patient from left side, 12 cases operated through supraorbital craniotomy and 12 cases were operated through the extended trans-supraorbital approach. In all cases there was no craniotome, a small drill was used to make 4 burr holes in 11 cases; one keyhole, one 2.5 cm behined (temporal), one anterior frontal(3 - 3.5 cm medial to the keyhole), and one posterior frontal(2.5 cm behined the anterior frontal). Followed by widening of the burr holes from their under surface without actually increasing their diameter, allowing easy passage of the. Gigli saw. In all other cases 3 burr holes only done; one key hole, one anterior frontal(3-3.5 cm medial to the key hole), one posterior frontal(2.5 cm behined the anterior frontal) to make a triangular bone flap. In transsupraorbital approach 3 burr holes was done, the same as above, then two cuts were done in the supraorbital ridge at the site of the medial burr hole and the other at the frontozygomatic suture by a small size osteotome, gentle dissection of the periorbita from the orbital roof, then one piece craniotomy was done by orbital roof fracture. Then the dura is opened in a C-shaped fashion based towards the base, or in a linear fashion at the base, with sufficient CSF drainage . Then general microsurgical technique was used to handle the lesion (The microscope used was Carl Zeiss OPMI Vario). At the end of operation the dura is closed in a water tight fashion, the bone flap is placed the burr holes were sealed by bone dust, in 4 cases acrylic (polymethyl methacrylate) was used to seal the burr holes when the defect was evident, in 1 case of the transsupraorbital approach microplates was used to fix the bone flap, the periosteum is closed , then the galea containing the frontalis muscle is closed by interrupted absorbable sutures and the skin is closed in a subcuticular cosmetic fashion, no drain is required.

Excision: Total excision was the target , but this was not possible in some cases due to infiltration, encasing or attachment to vital structures, in cases of pituitary macroadenoma the tumor capsule was not totally removed as a routine procedure in all cases . The excision was graded grss total, near total (90% was removed), subtotal (≥70% was removed) and partial (<70% was removed including biopsy).

RESULTS

Of the 24 patients with cranial base lesions, 15 patients reported visual improvement after surgery (62.5 %), 8 patients reported no change in visual function (33.3%), and 1 patient died early postoperatively (4.2%). Postoperative **endocrinal evaluation** showed improvement in 2 patients of pituitary macroadenoma in which a female patient with acromegalic features improved, and a male patient with nipple discharge has been stopped and impotence improved . three patients develop temporary diabetes insipidus. **Proptosis** in 1 patient with pituitary macroadenoma improved. **Cranial nerve assessment** showed that 1 patients with unilateral trigeminal pain totally improved postoperative (pituitary macroadenoma) , 1 patient with 6th nerve palsy that did not improve (pituitary macroadenoma) , and development of postoperative unilateral anosmia in 3 patients. Gross total removal achieved in 4 patients (16.7%); in 12 patients (50%) removal near total (more than 90%of the tumor); in 7 patients (29.1%) removal was subtotal (from 70-90% of the tumor); and in one patient (4.2%) removal was partial (less than 70% of the tumor).

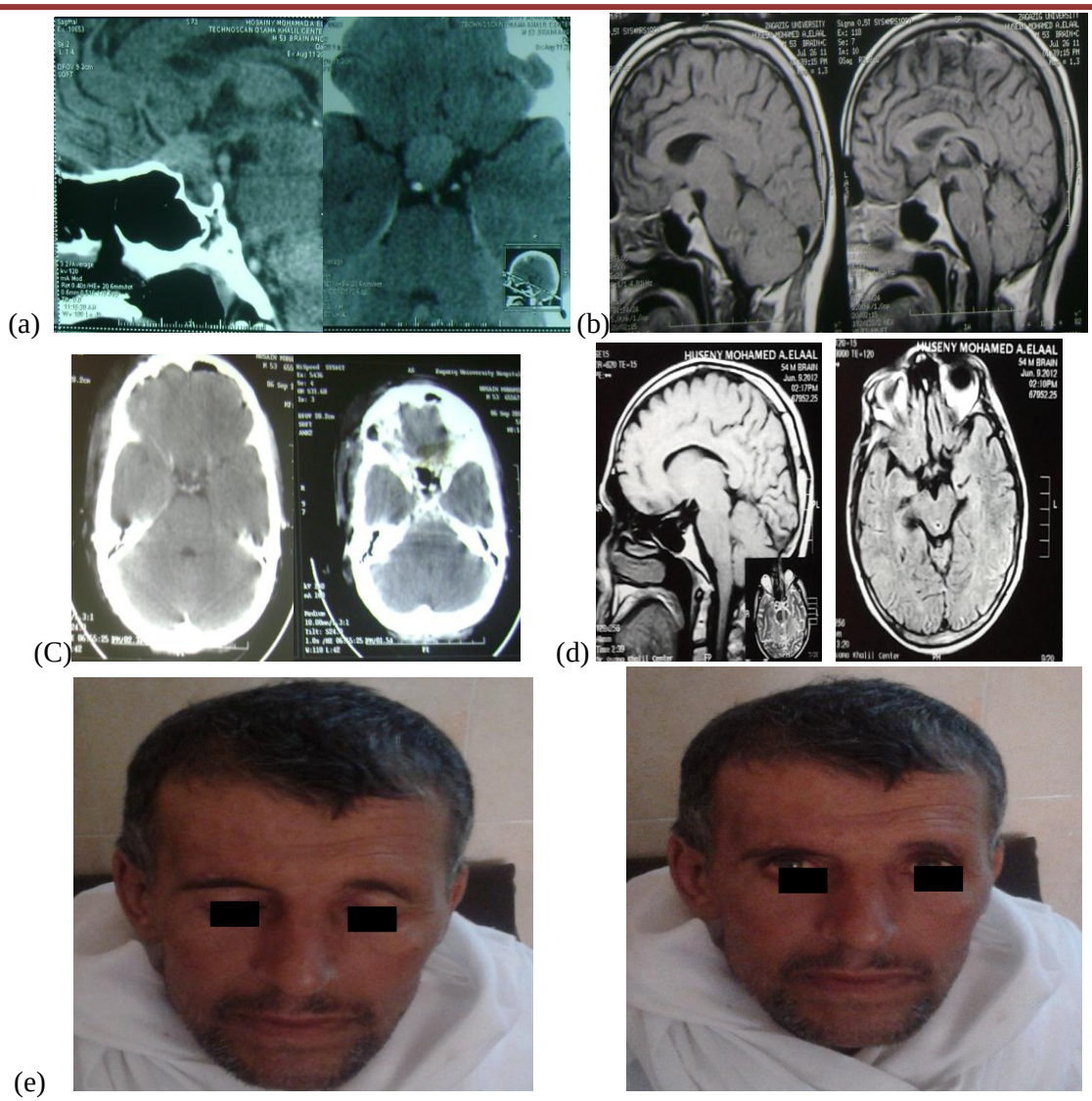
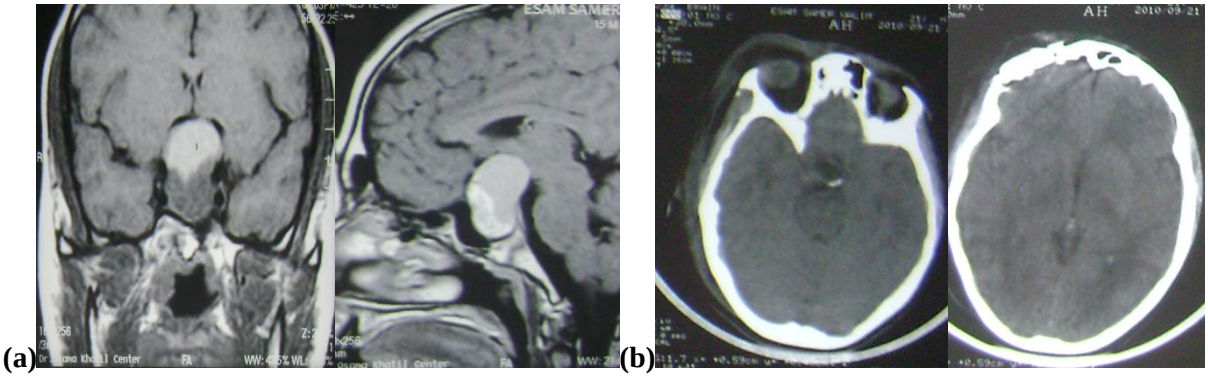
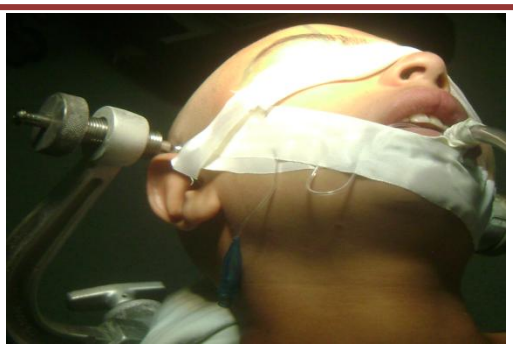
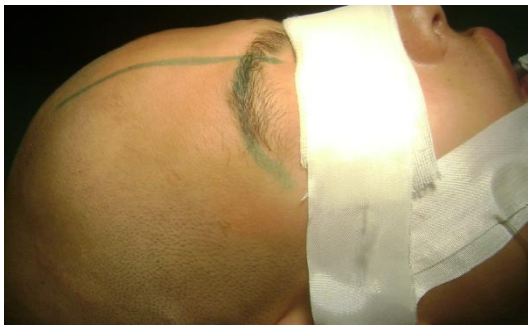
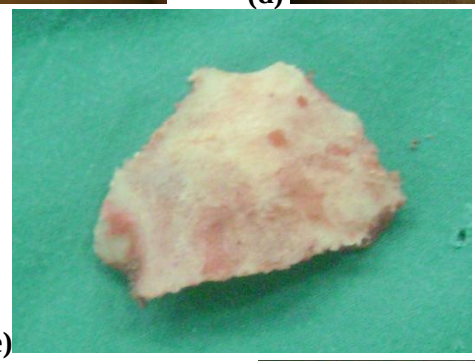
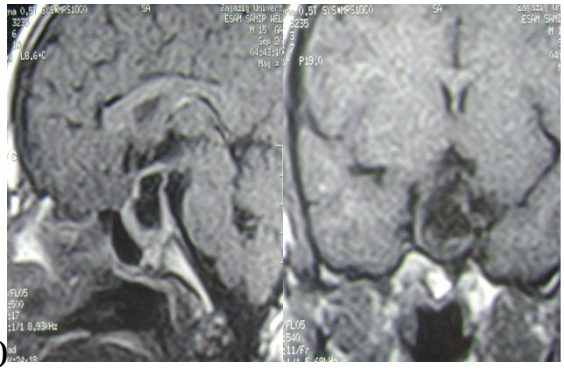
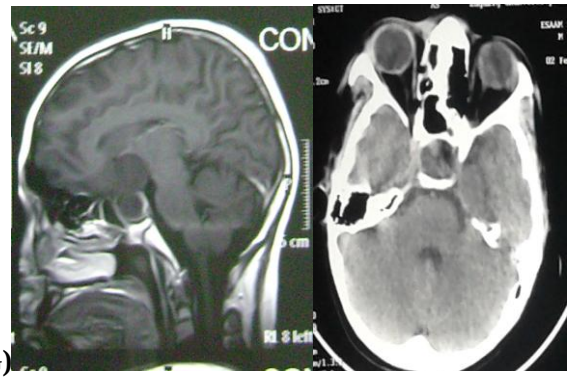


Fig. (1): [A] Preop CT, [B] MRI shows planum sphenoidal menengioma.[C] Postop CT scan shows total removal ,[D] MRI, 9 months postop. [e] patient , 6 months postop (no visible scar or disfigurement)..



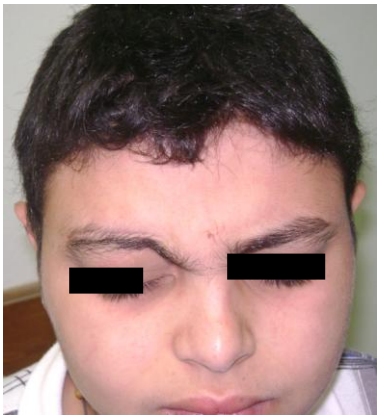



Fig (2): [a] preop. MRI shows craniopharyngioma, [b] CT 3 days postop., [c],[d] patient positioning., [e] bone flap,[f] MRI 2 weeks postop, [g] MRI, CT one month after completion of radiotherapy course, [h] patient 3 days after surgery, [i],[j] patient 3 month after surgery.

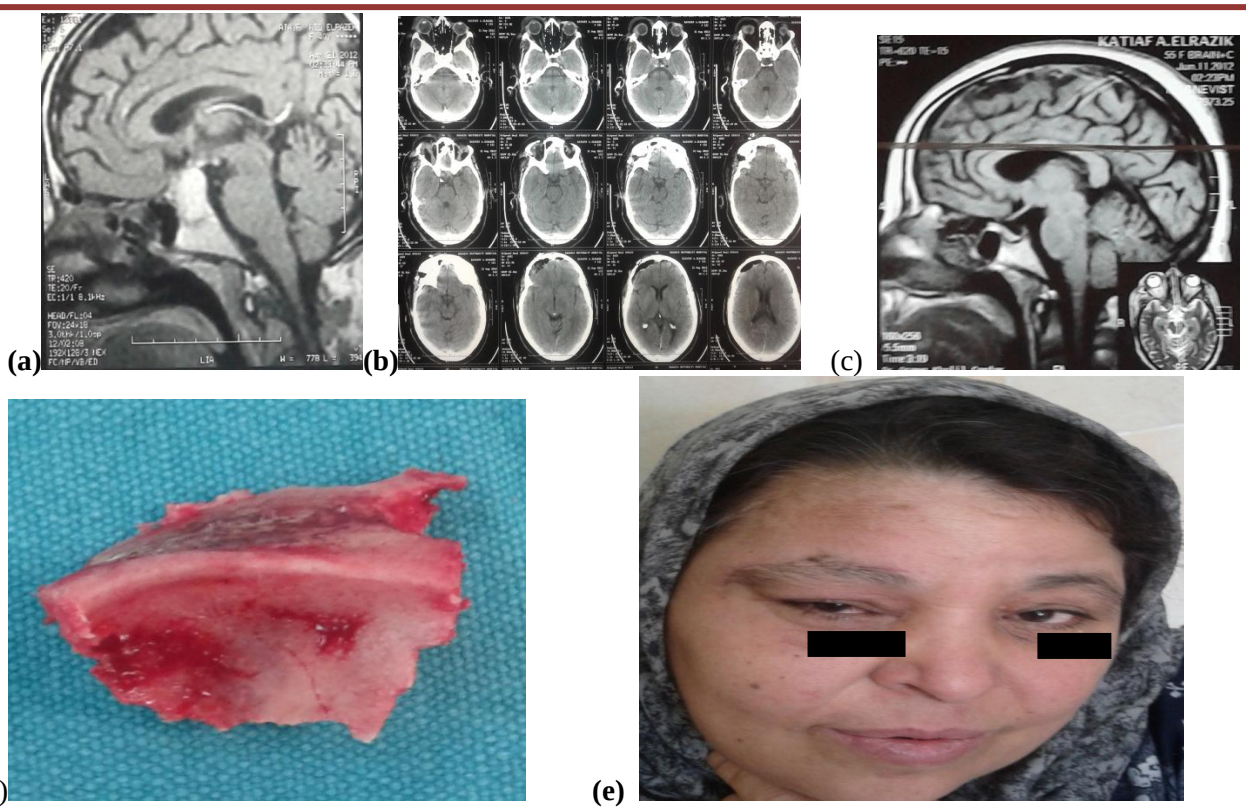


Fig (3): [a]preop.MRI pituitary macroadenoma, [b] CT 3 days postop., [c] MRI one month postop., [d] bone flap of the extended transsupraorbital craniotomt by orbital roof fracture., [e] patient one month postop.

COMPLICATIONS

Transient Periorbital oedema occurs in all patients and maximally resolves by the end of first week. Supraorbital hyposthesia was evident in 4 patients with dysthesia and improved 6 month postoperative and was temporary moderate hypothesia in 17 patients and resolved from 1 to 6 month postoperative and was very mild in 2 patients , resolved during the first month post operative . In 1 patients the supraorbital hyposthesia could not be assessd, because this patient died early in the postoperative period. During follow up period 1 patient showed right frontal and ethmoid sinus infection 16 month postoperative with subcuteanous collection of pus which subsides under medical treatment and also sinuscope was done. Cosmetic problems occur in 2 patients in which 1 patients had visible scar and 1 patient had visible burr hole. Eye brow elevation lost early in all patients, during follow up it subsided in all patients except, 1 patients in which this remained partially, and one patient died early in postoperative period. development of postoperative unilateral anosmia in 3 patients.

Complication	Number of patients	
	Transient	Permanent
Visual deterioration	0	0
Endocrinal complication	3	0
Cranial nerve affection	0	3
Subgaleal collection	8	0
wound infection	1	0
cosmetic problems	0	2
Lost eye brow elevation	22	1
Periorbital oedema	24	0
Supraorbital hypothesia	23	0

Table (2): postoperative complications

one patient died This patient had a pituitary macroadenoma, with evident supratentorial hydrocephalus. The tumor was excised near totally, and one day after surgery conscious level deteriorated, CT was done there was oedema of the tumor bed and increase of the preoperative existing hydrocephalus, frontal ventriculo-peritoneal shunt

was inserted the second day postoperative, patient did not show evident improvement then, died three days postoperative. it seems that the minimal invasive keyhole craniotomy is not suitable to operate on tight brain

DISCUSSION

A subfrontal and transfrontal approach was first described by **Francesco Durante in** 1884 for resection of an olfactory groove meningioma; the postoperative course was uneventful, the patient experienced no neurological deficits [33]. The first supraorbital subfrontal exposure was reported by **Fedor Kraus in 1908** in the first volume of his pioneering work, Surgery of the Brain and Spine. [16]**. McArthur**[18] in 1912 and **Frazier** in 1913 reported a similar approach for pituitary lesions removing the supraorbital rim to lessen brain retraction .**Tandler and Ranzi** in 1920 approached this area by a similar exposure for suprasellar lesions [32]. **Harvey Cushing** performed the first complete removal of a tuberculum sellae meningioma via subfrontal exposure in 1916 and reported his experiences on the resection of 28 tumors in his classic publication, coauthored by **Louise Eisenhardt** [5]. In 1920**, Heuer**[14] in 1920 reported on subfrontal approach for chiasmal lesions, while **Dandy**[35] published his results on subfrontal approach for eight cases with frontobasal menengiomas in 1922. However, the aforementioned authors used a wide skin incision, a wide craniotomy, exposing a large cortical surface with a wide opening to overcome poor illumination of deep seated intracranial operative fields. The progress development of diagnostic tools and introduction of surgical microscope, and microinstruments in neurosurgery pushed for further modifications and refinements [17,36]. Using the microsurgical techniques of **Yasargil** [36] **Dandy** in 1975, refined his frontolateral pterional approach, with drilling of the sphenoid ridge. Few years later a gradual limited approaches started to be introduced in the field of neurosurgery .**In 1978 Brock and Dietz**[4] described a limited frontolateral approach for aneurysms of the anterior circulation. However, **Jane et al**. [15] in 1982 described a supraorbital approach for aneurysms, suprasellar lesions,and orbital lesions**. Al-Mefty** [1] **and Al-Mefty and Fox**[2]) in 1985 published their experience concerning a supraorbital- pterional approach to cranial base lesions by incorporating the superior and lateral orbital walls . Many authors later described minicraniotomies for skull base lesions either tumors or aneurysms [3,6,7,10,11,20,21,22,23,24,30,35].

The lateral supraorbital approach was first presented at the "7th International Congress of Neurological Surgery." in 1981 by **Sanchez-Vazquez** [27]. The approach was later adopted by **Perneczky** in 1999 who extensively studied, developed the approach, modified its application and introduced the endoscope to overview and work in small hidden areas [25]. **Van Lindert et al**.[35] in 1998 published their experience on a supraorbital subfrontal craniotomy for intracranial aneurysms. However, **Czirják et al**.[6,7] in 2002, **Ramos-Zúniga et al.**[26] in 2002, **and Steiger et al**.[30] in 2001 published similar experience. **Sanchez-Vazquez** in 1999 in his study on 41 patients with different lesions, this included 31 cases with pituitary adenomas, 2 cases with olfactory groove meningiomas, and other cases with different aneurysms as AComA, PcomA, and ophthalmic artery aneurysms. He had no single mortality related to the approach. Aneurysms of the AComA could be dissected without sacrificing healthy brain tissue, or sacrificing the straight gyrus. He reported frontal hypoesthesia in all patients (as he extended the skin incision medially similar to our technique, but he did not dissect and mobilize the supraorbital neurovascular bundle, he sacrificed it directly). However, it disappeared completely in all patients, in some as early as the 2nd month after surgery. Inability to raise the eyebrow immediately after surgery was also evident in all patients; however it disappeared completely after the 3rd month following surgery [28]. In **Czirja'k** series puplished in 2001 the 53 patients with tumors operated upon by a supraorbital approach, 19 had frontobasal meningiomas, 15 had pituitary adenomas, 13 had craniopharyngiomas, 1 had an optic glioma, 3 had dorsal intraorbital tumors, 1 had histiocytosis X, 1 had aspergilloma, and l had chordoma. The sizes of the tumors varied from 1 to 6 cm. All of them were removed totally by unilateral keyhole craniotomies. He reported no complications related to the size of the craniotomy during minor surgery. The ipsilateral olfactory nerve was damaged in two patients with frontobasal meningiomas because the tumor was attached at the nerve entry and could not be identified. One patient who was operated upon for a pituitary tumor died because of postoperative vascular and endocrinological complications. [7]. **Shanno et al** in 2001 published their series about 72 patients operated by trans-supraorbital approach for different orbital lesions, anterior cranial fossa and parasellar region. The pathological findings were meningioma, in 40

patients (55.6%), followed by craniopharyngioma (6.9%), pituitary macroadenoma (6.9%), schwannoma (5.5%), and hemangioma (5.5 %,). Total resection was achieved in 54% of patients, with subtotal resection was achieved in the remaining 46%. No patients died [29]. The application of modern and special anesthetic techniques are very essential for good brain relaxation, minimizing brain retraction. Nevertheless , the size of craniotomy is not the aim, but an adequate, comfortable surgical approach with less brain exposure and minimal retraction is the golden rule. According to cone theory "the intracranial field widens as the distance increases from the entry point", means that the size of craniotomy plays no role with target lesion, however, the size of the inner field is the most important. Preoperative CT and MRI brain is very essential in planning the approach and the strategy of surgery. CT brain is helpful in planning the craniotomy flab regarding its site, size, and the position of frontal air sinus while, MRI brain is helpful in studying the tumor mass and the nearby surrounding structures to decide the type of approach. Minicraniotomy is not a minimal procedure, nor a minimal debulking surgery. Although the mean tumor size was 30.9±8.7 mm our study recorded successful total removal in 4 patients (16.7%), near total removal (≥90% of the tumor) in 12 patients (50%), in 7 patients (29.1%) removal was subtotal (from 70-90% of the tumor); and in one patient (4.2%) removal was partial (less than 70% of the tumor). It should be noted that treatment bias at our institution tends toward conservative (near or subtotal) resection, followed by staged radiosurgery or stereotactic radiotherapy especially in cases of pituitary macroadenoma and craniopharyngioma. It was proved that by total, near total or even subtotal excision of the lesion the neural structures are decompressed, the ICP is reduced and makes it more suitable for adjuvant therapy, which plays an important role in the outcome. We reported a good visual outcome (15 patients reported visual improvement after surgery (62.5 %), 8 patients reported no change in visual function (33.3%), and 1 patient (4.2%) died early postoperatively). Minicraniotomy characterized by a smaller bone flab, less tissue destruction, less time consuming, smaller and less invasive skin incision resulting in pleasant cosmetic outcome. Nevertheless, our study reported minor and common complications in addition to only 1 death in a patient with pituitary macroadenoma with hydrocephalus. The results, mortality and morbidity in our study, at least are comparable with, the results in recent reports[8,13,21,31,34]. We believe that, The Frontolateral key hole craniotomy is applicable minicraniotomy as an alternative minimal invasive approach to anterior cranial base lesions, in selected cases of lesions confined to the anterior cranial base, sellar, and suprasellar areas, without extension to middle cranial fossa, or extensive infiltration of neurovascular structures. It offers equal surgical possibilities with minimal brain retraction, allowing quick and minimally invasive access to the tumor with less brain exposure, and comparable results to standard approaches. In addition, the small skin incision, and small craniotomy result in a pleasing cosmetic outcome.

Our recommendations are:

- Careful preoperative planning including MRI and CT.CT 3D reconstruction will be very helpful especially with lesions in or around the sella , shallow anterior cranial fossa will hinder complete control of sellar lesions even with removal of the orbital edge and part of the orbital roof with the craniotomy flap.
- The extension of the skin incision, size of the craniotomy, should be individualized for each patient.
- Careful positioning is very important
- We donot encourage anyone to start immediately with minicraniotomy. Surgeons should keep their usual technique, with which they are comfortable, and progressively reduce the size of craniotomy before jumping to minicraniotomy .

REFERENCES

1. Al-Mefty O: The supraorbita lpterional approach to skull base lesions. Neurosurgery 21:474–477,1987.
2. Al-Mefty O, Fox JL: Superolateral orbital exposure and reconstruction. Surg Neurol 23:609–613, 1985.
3. Bakay L, Cares HL: Olfactory menengioma: Report on a series of twenty-five cases. Acta Neurochir (Wien) 26: 1–12, 1972.
4. Brock M, Dietz H: The small frontolateral approach for the microsurgical treatment of intracranial aneurysms. Neurochirurgia 21:185–191, 1978.
5. Cushing H, Eisenhardt L: Menengioma: Their Classification, Regiona Behaviour, Life History, and Surgical End Results. Springfield, Charles C Thomas, 1938 (New York, Hafner, 1969).
6. Czirják S, Nyáry I, Futó J, Szeifert GY: Bilateral supraorbital keyhole approach for multiple aneurysms via superciliary skin incision. Surg Neurol 57:314–324, 2002.

7. Czirják S, Szeifert GY: Surgical experience with frontolateral keyhole craniotomy through a superciliary skin incision. Neurosurgery 48:145–150, 2001.
8. El-Gindi S: Olfactory groove menengioma: Surgical techniques and pitfalls. Surg Neurol 54: 415– 417, 2000.
9. Frazier CH: An approach to the hypophysis through the anterior cranial fossa. Ann Surg 1:145–150, 1913
10. Fries G, Perneczky A: Endoscope-assisted brain surgery: Part 2—Analysis of 380 procedures. Neurosurgery 42:226– 232, 1998.
11. Fries G, Perneczky A: Endoscope-assisted keyhole surgery for aneurysms of the anterior circulation and the basilar apex. Operat Tech Neurosurg 3:216–230, 2000.
12. Gonzales LF, Crawford NR, Horgan MA, Deshmukh P, Zabramski JM, Spetzler RF: Working area and angle of attack in three cranial base approaches: Pterional, orbitozygomatic, and maxillar extension of the orbitozygomatic approach. Neurosurgery 50:550–557, 2002.
13. Hassler W, Zentner J: Pterional approach for surgical treatment of olfactory groove menengioma. Neurosurgery 25: 942–947, 1989.
14. Heuer GJ: Surgical experience with an intracranial approach to chiasmal lesions. Arch Surg 1:368– 381, 1920.
15. Jane JA, Park TS, Pobereskin LH, Winn HR, Butler AB: The supraorbital approach: Technical note. Neurosurgery 11:537–542, 1982
16. Krause F: Chirurgie des Gehirns und Rückenmarks nach eigenen Erfahrungen. Berlin, Urban & Schwarzenberg, 1908, vol 1.
17. Kurze T: Microtechniques in neurological surgery. Clin Neurosurg 11:128–137, 1964.
18. McArthur LL: An aseptic surgical access to the pituitary body and its neighbourhood. JAMA 58:2009–2011, 1912.
19- Methee Wongsirisuwan , Anant Ananthanandorn , Pravit Prachasinchai . The Comparison of Conventional Pterional and Transciliary Keyhole Approaches: Pro and Con J Med Assoc Thai Vol. 87 No.8 2004
20. Obeid, F., Al-Mefty, O: Recurrence of Olfactory Groove Menengioma [CLINICAL STUDIES] Neurosurgery. 53 (3): 534-543, September 2003.
21. Ojemann RG: Management of cranial and spinal menengioma (Honored Guest presentation). Clin Neurosurg 40: 321–383, 1992.
22- Paladino J, Pirker N, Stimac D, et al: Eyebrow keyhole approach in vascular neurosurgery. Minim Invasive Neurosurg . 41: 200-3. 1998
23. Perneczky A: Planning strategies for the suprasellar region: Philosophy of approaches. Neurosurgeons 11:343–348, 1992.
24. Perneczky A, Fries G: Endoscope-assisted brain surgery: Part 1—Evolution, basic concept, and current technique. Neurosurgery 42:219–225, 1998.
25. Perneczky A, Müller-Forell W, van Lindert E, Fries G: Keyhole Concept in Neurosurgery. Stuttgart, Thieme Medical Publishers, 1999.
26. Ramos-Zúniga R, Velázquez H, Barajas M, López R, Sánchez E, Trejo S: Trans-supraorbital approach to supratentorial aneurysms. Neurosurgery 51:125–131, 2002
27-.Sanchez-Vazquez M.A.Transciliary subfrontal approach for tumors of the sellar region. Neurochirurgia 24 (Suppl):395. 1981
28- Sanchez-Vasquez M.A, Barrera-Calatyud P, Mejia-Villela M, Palma-Silva J.F, Juan-Carachure I, Gomez-Aguilar J.M. and Sanchez-Herrra, F. Transciliary subfrontal craniotomy for anterior skull base lesions. J Neurosurg 91:892– 896. 1999
29-Shanno G, Maus M, Bilyk J, Schwartz S, Savino P, Simeone F and Goldman H . Image-guided transorbital roof craniotomy via a suprabow approach: surgical series of 72 patients. Neurosurgery 48:559–68. 2001
30. Steiger HJ, Schmid-Elsaesser R,Stummer W, Uhl E: Transorbital key-hole approach to anterior communicating artery aneurysms. Neurosurgery 48:347–352, 2001.
31. Symon L: Olfactory groove and suprasellar meningiomas,in Advances and Technical Standards in Neurosurgery. Wien, Springer, vol 4, pp 67–91. 1977
32. Tandler J, Ranzi E: Surgical anatomy and operation technology of the central nervous system, Berlin, Springer, 1920.
33. Thorwald J: Im zerbrechlichen Haus der Seele. Munich, Droemer- Knaur Verlag, 1986.
34. Tsikoudas A, Martin-Hirsch DP: Olfactory groove menengioma. Clin Otolaryngol 24: 507–509, 1999.
35. van Lindert E, Perneczky A, Fries G, Pierangeli E: The supraorbital keyhole approach to supratentorial aneurysms: Concept and technique. Surg Neurol49:481–490, 1998.
36. Yasargil MG, Fox JL, Ray MW: The operative approach to aneurysms of the anterior communicating artery, in Krayenbühl H (ed): Advances and Technical Standards in Neurosurgery. Vienna, Springer Verlag, vol 2, pp 1. 1975

التدخل الأمامي الجانبي عن طريق فتح الجمجمة المحدود لمنطقة الحفرة الأمامية لقاع الجمجمة

لقد مرت الطرق الجراحية لعلاج أمراض الغرفة الأمامية للجمجمة بمراحل تاريخية متتابعة كان الغرض في كل منها تقليل حجم الفتحة في الجلد وعظام الجمجمة وتقليل الضغط على أنسجة المخ مع ضمان كفاءة الجراحة. ونظراً لتطور الجراحة الميكروسكوبية وطرق التخدير وبذل السائل المخي يمكن القيام بطرق أخرى جراحية تقل معها المضاعفات مع ضمان كفاءتها في علاج هذه الأمراض. ومن هذه الطرق طريقة التدخل الأمامي الجانبي عن طريق فتحة صغيرة فوق الحاجب لعلاج أمراض الحفرة الأمامية لقاع الجمجمة ومنطقة سرج الحصان. وتستخدم هذه الطريقة لعلاج الأورام المختلفة والعيوب الخلقية وأمراض الشرايين ومختلف الأمراض الأخرى.

تعتبر هذه الطريقة الجراحية ترجمة حقيقية للمفهوم الجراحي، جراحة ثقب المفتاح وهو مصمم للعلاج الميكروسكوبي لأمراض المخ عن طريق شباك عظمي صغير. وهو لا يعنى فقط مجرد التعريف التشريحي للكلمة ولكن يركز أيضاً على تقليل حجم الضرر في كل خطوة من الجراحة. والتخطيط الجيد لهذا النوع من الجراحة يشمل التشخيص السليم بالفحص الإكلينيكي وأنواع الأشعة المختلفة ومعرفة التشريح الميكروسكوبي ومختلف الأمراض التي تخص الجزء المراد إجراء الجراحة به و تحديد ما إذا كان هذا المدخل مناسبا لعلاج هذا المرض أم لا.

وفي هذا الدراسة تم اختيار 24 مريضاً يعانون من أمراض جراحية مختلفة بالحفرة الأمامية للجمجمة ومنطقة سرج الحصان وتم إجراء التدخل الجراحي عن طريق فتحة فوق الحاجب . وكان الاهتمام منصباً على تقييم هذه الطريقة وأسباب استخدامها ومميزاتها وعيوبها ودراسة كيفية إجرائها ومقارنتها بالطرق الجراحية الأخرى لعلاج أمراض الغرفة الأمامية لقاع الجمجمة ومنطقة سرج الحصان. وتبين من خلال النتائج أن هذا المدخل قد يكون مناسبا جداً وآمناً لمختلف الأمراض خصوصاً مع التطور الهائل في التخدير والجراحات الميكروسكوبية مع التأكيد على التحذير من سوء استعمال هذا المدخل في كثير من الحالات غير المناسبة مثل بعض الأورام الكبيرة أو تلك التى تمتد إلى الحفرة الوسطى أوالخلفية لقاع الجمجمة أو عدم خبرة الجراح أو جاهزية حجرة العمليات لآداء مثل هذا النوع من الجراحات الدقيقة.

إن هذه الارشاد ت يجب أن تتبع عند استخدام هذا النوع من الجراحة للحصول على أفضل النتائج مع مضاعفات اقل :

1- تخطيط أمثل قبل و اثناء و بعد الجراحة
2- تحسين مهارات استخدام الميكروسكوب الجراحي
3 .توافر آلات جراحية تسهل للجراح عمله
4 .متابعة منتظمة للمريض بعد العملية
5 .تعاون وثيق لفريق العمل بين الجراح و أطباء التخدير،وأطباء الأشعة.