

The advantage of the Gigli saw in performing mid-frontobasal craniotomy over the power driven tools

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The mid-frontobasal approach can be carried out with the help of several tools, thanks to the technical improvements in the neurosurgical field. Cutting thick bone is one of the drawbacks of the power saw, this needs rongeur of the bone or the use of manual spiral wire with handle.¹ The use of the Gigli saw² requires additional time compared with power-driven drills, however, this is amply compensated at closure, as the need for fixation of the bone flap by wiring or mini-plating is obviated in this bone-sparing technique. The frontal sinus can be opened and closed easily without the need for special maneuvers to plug the sinus, the follow-up of these patients revealed that the sinus becomes aerated without an increase in the incidence of infection or CSF leak.

In performing a mid-frontobasal craniotomy, 3 5mm burr-holes are connected. With the use of a conventional guiding probe the Gigli saw is conveyed routinely from one burr-hole to another (Figure 1). A dural dissector can be used before the guiding wire if the frontal dura is fragile and adhesive to the bone. The cut through the bone is sawn obliquely (beveled). Bone cutting by Gigli saw in between burr holes is narrow and beveled, so the flap will sit well without sinking at the end of operation, while the cut made with power drills is wider and beveling may not be possible.³ In order to make the basal cut as low as possible, the dura mater is disengaged from the bone by Penfield #3 and a dural dissector, the guiding probe can be shifted from one burr-hole to another through the cut in between. As the superior sagittal sinus is rudimentary at the level of the crista frontalis the blind dissection is completely safe.⁴ The bony ridges at the inside of the skull can be passed, and the frontal sinus can be opened as low as possible using the Gigli saw (Figure 2).

The mid-Frontobasal approach was used in 23 patients between 10-65 years at King Hussein Medical Center, Amman, Jordan. This approach can be used for different types of pathology in the anterior cranial fossa and suprasellar region (Table 1).

Nowadays, power-driven tools are widely used to raise a bone-flap in a short time. However, the bone-flap made by a drill or craniotome requires expensive and time-consuming mini-plating or wiring at closure; this can be a real problem in



Figure 1 - The guiding probe of Gigli saw is conveyed from one burr hole to another.



Figure 2 - Complete mid-frontobasal craniotomy flushed with the base of the anterior fossa and frontal sinuses.

Table 1 - Different types of pathology in the anterior cranial fossa and suprasellar region.

Type of tumor	Number of patients
Suprasellar meningioma	2
Olfactory groove meningioma	6
Craniopharyngioma	7
Pituitary tumor	8

countries with limited resources and budgets. The Gigli saw is a simple and cheap surgical instrument that allows easily attained beveling of bone, preventing depression of the bone flap and obviating the need for expensive plating. The aesthetic result at closure of the craniotomy is easily achieved even without any type of fixation of the bone flap.⁴ The frontal sinus is opened in line with the anterior cranial fossa minimizing the traction applied to the frontal lobes, at closure the edges of the bone flap can easily adapt with the edges at the base of the skull without the need for plugging the sinus. Moreover, the sinus was found to be well aerated postoperatively. Cerebrospinal fluid leakage needs to be avoided by achieving watertight dural closure. The dura may be expanded using autologous fascia lata graft.⁵ In all our cases the sinus was left without any manipulation, the dura was closed tightly and the bone flap secured in place without any type of support except the overlying pericranium and scalp. No wound infection or CSF leak was registered. Sinus complication after frontal craniotomy is well known, the usual etiological factor in these complications is the opening of the frontal sinus with violation of the frontal sinus mucosa, trapping of the mucosa in the frontal osteotomy and obstruction of the nasal frontal duct by foreign body or depressed bone fragments. Bone wax is frequently applied to bone edges at the time of craniotomy if the frontal sinus has been opened and that wax enters the sinus, this foreign body promotes a chronic inflammatory response which

may eventually obstruct the nasofrontal duct, a mucocele results with recurrent episodes of acute inflammation.

In conclusion, the Gigli saw is very effective in performing a mid-frontobasal craniotomy in a simple and cheap way. No plating or wiring is required, the dura can be disengaged in an elegant manner from the internal bony crests by swiveling and sliding the guiding probe. The aesthetic result with this technique is very good and can be achieved easily and inexpensively.

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