

Consideration on Hemicraniectomy – Part II

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Abstract

Decompressive hemicraniectomy is a surgical technique used to relieve the increased intracranial pressure. The aim of the current paper is to present our surgical technique and experience used in performing hemicraniectomies, technique that we consider optimal for his purpose. Our experience consists in 17 operated cases and eleven patients (64.7%) were long term survivors.

Keywords: decompressive hemicraniectomy, increased intracranial pressure, surgical technique

Consideration on hemicraniectomy, part I was published in Volume XVI, no. 1/2009 of Romanian Neurosurgery We presented our experience in the field and discussed clinical aspects, indication and outcomes. The part II of this paper comes to detail our surgical technique with images.

Surgical technique considerations

The patient is placed with the side of craniotomy upward, head elevated to 15 degrees. The line of skin incision is described from posterior to anterior: beginning retro-auricular (to the mastoid), extended in a supero-posterior manner and then reversed to anterior approximately 2 cm parallel to the sagittal line until the widow peak, then reversed infero-basal, respecting the hair line to the preauricular region (Figure 1). Care must be taken to preserve the principal ramifications of temporary artery inside de musculocutaneous flaps to avoiding devascularisation and necrosis of the incision edge.

A large periosteal tissue flap is harvested from the entire exposed area for anterior duroplasty (Figure 2). Using a monopolar subperiosteal dissection the temporalis muscle is reflected basally.

The margins and burr holes for hemicraniectomy, described from antero-basal to posterior are: temporo-basal, under the level of ear pina; pterional at the site of the classic keyhole; fronto-basal, above the level of frontal sinus, to expose frontal pole but avoid entry in the frontal air cells sinus; then along the planned paramedial craniectomy margin, 2 cm parasagittal (avoid lesions over saggital sinus bridging veins and arachnoid's granulations), to lambda point; then antero-basal, tangent with lambdoid suture, until 1 cm above the asterion (to avoid lacerations of transverse-sigmoid sinus) (Figure 3). The sphenoid wing is fractured and removed. Decompression was extended far enough to the floor of the middle fossa to relieve pressure from the herniating mediobasal temporal lobe and up to the midline to

avoid compression of the bridging veins (1-2 cm) (1). The cranial vault is removed.

Dura is opened by a large radial incision to allow the brain to expand outward (Figure 4) (2). Prophylactic, if the intracranial pressure is not elevated, dural edges are tacked up to bony margins.

Large duraplasty with extra space for brain to enlarge, using all periosteal tissue from the cranial vault is performed (Figure 5). It is important that the duroplasty to have a “sun flower shape”, to permit free enlargement of the brain without damaging the cortical substance. The temporalis muscle is resting on the dural surface. Extradural drain is placed. Cutaneous flap is sutured in one plane in a Donati manner.



Figure 1 The patient is placed within the side of craniotomy upward, head elevated to 15 degree. The line of skin incision is

described from posterior to anterior: beginning retro-auricular (to the mastoid), extended in a supero-posterior manner and then reversed to anterior approximately 2 cm parallel to the sagittal line until the widow peak, then reversed infero-basal, respecting the hair line to preauricular region. To avoid necrosis of the skin incision edge, care must be tacked to preserve the principal ramifications of temporary artery inside de musculocutaneous flaps.



Figure 2 An large periosteal tissue flaps is recolctated for ulterior duroplasty

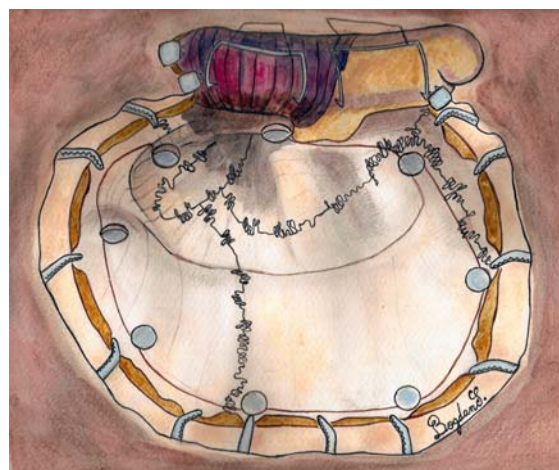


Figure 3 The temporalis muscle is reflected basally. The margins and key-hole for hemicraniectomy, described

from antero-basal to posterior are: temporo-basal, under the level of ear pina; pterional aproximately at the site of the classic keyhole; fronto-basal, above the level of frontal sinus, to expose frontal pole but avoid entry in the frontal air cells sinus; then along the planned paramedial craniectomy margin, 2 cm parasagittal (avoid lesions over saggital sinus and bridging veins), until lambda point; than antero-basal, tangential with lambdoid suture, until aproximately 1 cm above the asterion (to evoid entry in transverse-sigmoid sinus).

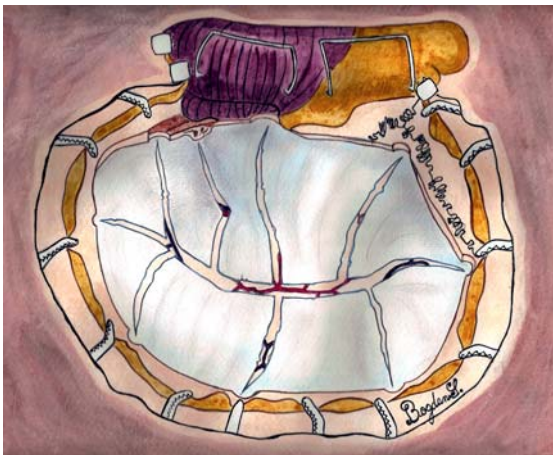


Figure 4 The dura is opened by a linear incision extended radial to allow the brain to expand outward.



Figure 5 Large duroplasty with extra space for brain to enlarge, using all periosteal tissue recoltated from the cranial vault is made.

References

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