

## Letter to the editor regarding “Autologous bone dust technique for one burr hole surgery to prevent severe skin depression” and proposal for a technical adjunct



We read with interest the article recently published in *Clinical Neurology and Neurosurgery* by Ichimura and colleagues [1]. One burr hole surgery is a very common treatment modality for frequently encountered diseases like chronic subdural hematoma or for stereotactic procedures (such as minimal invasive intracerebral hematoma suction or needle brain biopsy). Even if these procedures are technically easy and usually performed in elderly patients and/or in patient without a long life expectation, cosmetic concerns due to skin depression deserve our attention. Moreover, the same issues involve the burr holes required to perform a craniotomy in major cranial surgery.

The burr hole defect can be managed in various ways:

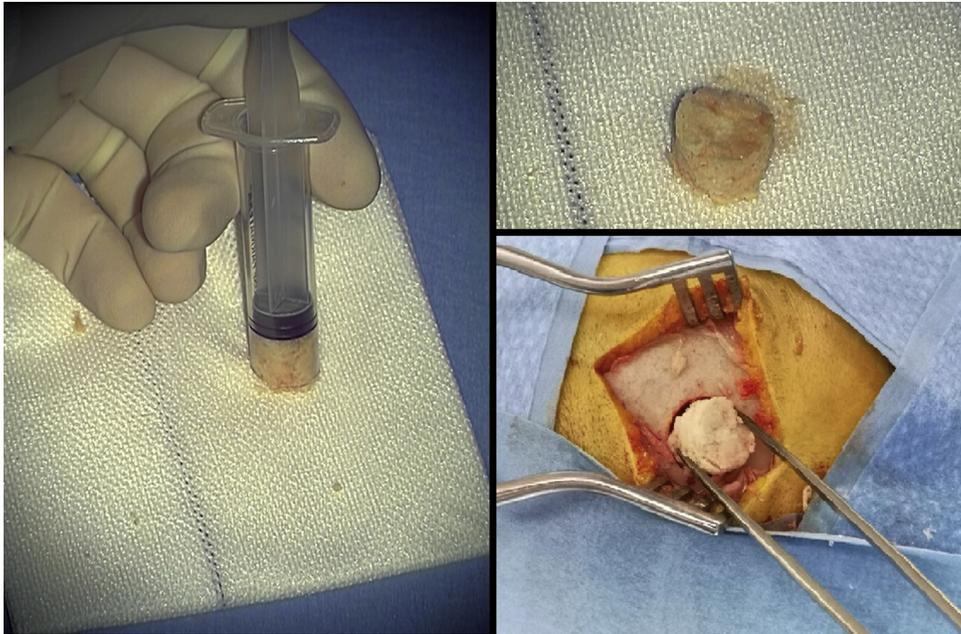
- 1 Left uncovered (with the higher rate of unfavorable cosmetic results);
- 2 Covered or plugged with eterologous materials (with the possibility of a foreign-body reaction or local infection) [1];
- 3 Covered with autologous cortical bone graft (applicable only to craniotomy-associated burr holes and time consuming) [2];
- 4 Plugged with autologous bone dust: either simply inserted into the hole [1], or previously augmented with fibrin glue [3], or previously compressed [4,5].

In their case series Ichimura et al. used autologous bone dust simply inserted into the burr hole, supported by absorbable gelatin sponge. Bone dust is a mixture of cancellous and cortical bone: as the authors state, cancellous bone contains higher concentrations of osteoblasts and

osteocytes compared to cortical bone, giving bone dust a superior osteogenic potential than cortical bone graft. Fibrin glue, not used by the authors, can be used as an adjunct to bone dust, but indeed it does not appear to further improve ossification induced by bone dust and increases treatment costs [5].

What could improve ossification would be a higher density of osteogenic components of bone dust. This can be achieved by compressing the bone dust into a solid plug before inserting it into the burr hole. A simple but efficient technique is to put the autologous bone dust into a 5 ml syringe and strongly compress the piston, as described by Boström et al. [4] and subsequently by Kubota et al. [5]. Purpose built devices have also been proposed [4,6], but in our opinion the 5 ml syringe is preferable being efficient, simple and almost costless. Ossification rate seems to be further improved by covering the bone plug with the preserved periosteum [5].

In our center we use the compressed autologous bone dust routinely for one burr hole surgery, in particular in stereotactic procedures (in fact, due to the absence of drainage, the compressed bone plug fits perfectly into the burr hole used for needle brain biopsies) (Fig. 1). Due to its simplicity, inexpensiveness, and effectiveness in preventing postoperative skin depression, we suggest the compressed bone dust technique as a useful adjunct to the technique reported by Ichimura and colleagues.



**Fig. 1.** Compressed bone dust technique. The endpiece of a 5 ml syringe is cut off and the autologous bone dust is inserted. The piston is strongly compressed against a gauze, allowing the excess liquid to exit and the bone fragments to compact. The solid plug obtained is inserted into the burr hole.

## References

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