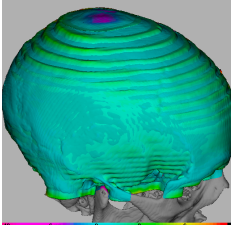
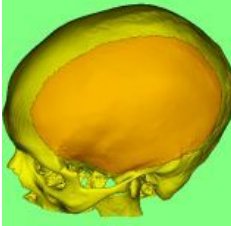
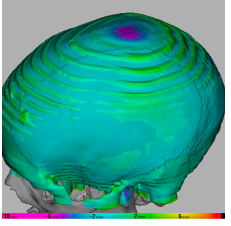


## **Is my new head the same as my old one?**

- Craniotomy (removal of part of the skull) surgical procedures are usually done shortly after very serious trauma (e.g. accident, assault) to allow brain to swell freely which will minimise damage to the person's future faculties/abilities
- Once swelling has resorbed, the physical result is a more or less large hole in the skull that cannot always be closed by putting the patient's bone back. A cranioplasty implant is therefore manufactured in biocompatible material, such as titanium, to replace the removed bone and restore the protection and shape to the head.
- Cavendish Implants Ltd designs and manufactures customised cranioplasty implants. Most patients will not actually know whether their implant has been made especially for them (they are medical devices ordered by the neurosurgeon, never by the patients themselves) or whether it is just an adaptation of off-the-shelf items.
- Mr Brock of Manchester whose survival to a life-threatening climbing accident in the Peak District in April 2010 is partly due to a craniotomy being performed shortly after his admission to ICU at Queen Elizabeth hospital, Nottingham, will have his customised Cavendish Implants cranioplasty plate fitted on 21 Oct 2010.
- He called Cavendish Implants last week asking "How can you be sure it will be the same shape that my bone used to be?". The reality is that we cannot be sure that the implant will be exactly as the bone used to be. This is because it is extremely rare for patients to have a 3D record of the shape of their skull prior craniotomy that can define the shape of the implant. Therefore, we cannot know for sure.
- Mr Brock was keen to look for such data for Cavendish Implants to compare his implant design with his original skull shape. He thus contacted Nottingham QE and obtained CT data that, even if not with very fine bony details, could give us this very rare opportunity to check the validity of our CAD design on a real case.
- The comparison of this design with Mr Brock's initial original shape was done yesterday within hours of receiving Mr Brock's pre-craniotomy scan from Nottingham and the results are spot on: Mr Brock's implant is extremely similar to his original bone, even down to the continuity of the frontal suture line.
- Cavendish Implants wish to thank Mr Brock for giving us this rare opportunity to compare our design with its gold-standard: the shape that he used to be. We are not surprised by the

results as other types of studies have already validated the design process. But it is the best comparison that we can hope for and we look forward to Mr Brock's follow-up call once the implant is fitted.

- Mr Brock has a bubbly personality and is happy to be contacted.
- Surgeons whose patients await a cranioplasty implant can have access to customised implants or templates of repairs *and* fast service (usually 4 days) providing that they know about us: the details of our products is at [www.cavendishimplants.com](http://www.cavendishimplants.com).
- Images (labelled and higher resolution images and computer-generated animations available)

	<p>This shows the colour-coded difference between Mr Brock's normal side of the skull prior and after craniotomy. As expected, there is no difference (turquoise colour) between the 2 scans. The green and blue stripe effect is due to the difference in resolution (<math>\pm 2.5\text{mm}</math>) between the scan prior to craniotomy (low resolution scan, i.e. 5mm-thick slices that create this stair-like contour) and the scan post craniotomy (high resolution scan i.e. 1mm-slices: the skull shape is defined much more precisely).</p>
	<p>This shows the extent of Mr Brock's defect and the design of his implant (Mr Brock's bone in yellow, the implant covering the cranioplasty hole in orange).</p>
	<p>The implant design is here compared with Mr Brock's skull prior to craniotomy. This shows no significant difference (turquoise colour) between the design and his "old" head shape. It is indeed exceptional that we are able to show this, as we don't usually have access to pre-craniotomy data.</p>

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Date : Friday 8 October 2010