The Birmingham Mid Head Resection (BMHR) was developed in response to an unmet need of providing a less invasive procedure for those patients in whom poor femoral head bone quality precludes the use of a hip resurfacing. This device does not violate the femoral shaft and was designed to take advantage of the natural proximal femoral anatomy. The short stem of the BMHR has a proximal porous load-bearing cone which fits into the prepared lower half of the femoral head and the femoral neck. The interior of this region of the femur lends itself to be shaped into a receiving cone into which the stem securely fixes. The socket component and the bearing of the device are identical to that of a Birmingham Hip Resurfacing (BHR). A modular head which matches the socket fits onto the BMHR stem through a 12/14 taper. Since this device employs the same socket and bearing as a resurfacing and the difference is only in the bigger stem which fixes into the femoral head and neck, it has also been aptly called a "Resurfacing Plus" procedure.

The line of resection of the femoral head is through the middle portion of the femoral head which ensures removal of the poor quality bone from the top half of the femoral head, while retaining the lower part of the femoral head which contributes to load transfer from the stem. The effect of continued load-bearing through this upper region of the femur prevents stress-shielding deterioration of the neck which has been observed in other neck preserving total hip replacements. The benefit with this procedure is that it leaves the option of conversion to a total hip replacement open for the future, should the need arise.

The design of the BMHR, which began in early 2002, was therefore based on sound anatomical and biomechanical considerations. Since the BMHR employs the same socket and the same bearing as a BHR the wear performance is similar to the BHR. The main issue with the BMHR was whether the stem design would favour robust fixation and enduring stability and whether implant-bone load transmission would provide safe and effective loads through the proximal femur to allow the bone to withstand it in the initial phase and be strengthened through continued physiological loading in the long-term.

Preclinical finite element analyses proved that load transmission was favourable. Implantation in patients after informed consent was started in January 2003. The first thirteen devices were inserted as a clinicoradiological and RSA study, in order to ensure that the stem fixation was stable and that there was no evidence of proximal femoral stress shielding. The RSA study was conducted at the Birmingham Nuffield Hospital and we waited until the 2-year results were available before proceeding with further implantations. These 2-year RSA results and the radiological appearances confirmed stem stability and did not show evidence of stress shielding. This work has been presented in national and international conferences and is being prepared for peer-reviewed publication.

When CE marking of the device was obtained we started implantation. This device is currently being used with satisfactory early results by leading surgeons in the UK, continental Europe, Asia and Australia.