Conventional pre-operative planning for Hemi-arthroplasty is performed with caliper, protractor, transparent templates and x-ray sheets. This technique is time consuming with many errors. Computer-aided pre-operative planning systems can assist surgeons in selecting correct sized implantable acetabulam and accurate planning of an operation. This paper describes the pre-operative planning by digital image processing techniques for Total Hip Replacement by using 2D digital X-ray images which leads to the development of a software for surgeons and radiographers. The authors have used advanced image processing techniques and algorithms in image enhancement, calibration, planning, templating and reporting to overcome problems faced while doing all these manually. The proposed methodology provides accurate, computer programmed, user-friendly and dimensionally correct solution. The technique seems to be reliable and acceptable to patients, radiographers and surgeons.
Automated Preoperative Planning of Acetabulum Size and Angle Detection for Hemi-arthroplasty

An Automated Size Recognition Technique For Acetabular Implant In Total Hip Replacement


A Simple Guide to Determine the Magnification of Radiographs and to Improve the Accuracy of Preoperative Templating;


Monika Michalikova, Lucia Bednarcikova, Martin Petrík, Jozef Zivcak, Richard Rasi, Acta Polytechnica Hungarica

The Digital Pre-Operative Planning Of Total Hip Arthroplasty;


Schiffers N., Schkommodau E., Portheine F., Radermacher K., Staudte H. W. Planning and performance of orthopedic surgery with the help of individual templates.

Orthopa¨de. 2000 ; (636-640)


Sue Wu, Adnan Amin; Automatic Thresholding of Gray-Level Using Multi-Stage Approach;

Seventh International Conference on Document Analysis and Recognition (ICDAR 2003) IEEE

TODSAPORN Fuangrod, AMNACH Khawne and MITSUHASHI Wataru

Computer-Aided Pre-Operative Planning System for Total Hip Replacement by Using 2d X-Ray Images;

SICE Annual Conference 2008


Yonghong Xie and Qiang Ji.

A New Efficient Ellipse Detection Method;

IEEE 2002

Index Terms

Computer Science Signal Processing

Keywords

Total Hip Replacement  Preoperative Planning  Digital Image Processing