"The role of modularity in primary hip arthroplasty"

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Monoblock

Dual Bron™ Modular Shoulder Neck

Introduction

Hip arthritis is a common and disabling condition. Efforts to replace the hip joint have always been confounded by the problems of fixation of the components to the skeleton and wear of the articulation.

The problem of fixation although still present, has to be overcome with methylmethacrylate or modern ingrowth surfaces.

New bearing surfaces such as ceramic on ceramic and metal on metal and the new highly cross linked polyethylene have introduced problems of their own but have greatly lessened

the incidence of wear related problems that were encountered in the past.

As the issues of fixation and wear have lessened, physicians are focusing on more subtle issues relating to total hip arthroplasty. One such issue is restoring a patient's normal hip biomechanics during the hip replacement procedure. Leg length and femoral offset are two such issues.

Standard hip replacement components are based on anthropometric studies. Neck offset and neck lengths are based on averages but not all patients fit within the average ranges.

Most femoral components available have neck lengths and offsets that increase with increasing stem sizes. The options available do not accommodate patients with small canals and large offsets, or large canals with small offsets or abnormally valgus or varus neck angles.

To accommodate all the variables stem inventories would have to be impossibly large.

Failed Ti modular neck

Modular stems have been introduced. These modular stems allow for many variations in stem geometry while keeping inventory levels down. While modularity has these advantages, it does come with its own problems. Modular junctions can fail, fretting at modular junctions can occur and component fractures have been seen.

Discussion

Taper wedge stems have been shown to give excellent long-term clinical outcomes. Developing modularity in these stems has been difficult because they normally have small AP dimensions, which do not allow enough metal bulk for traditional modular junctions of the female male type. This proximal modular stem has a unique junction design (Dual Press) that when assembled is strong and has the biomechanical strengths of a monoblock stem.

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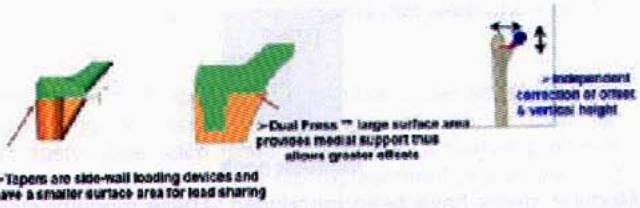

Comparing a standard stem to modular stem we have found that the modular stem reproduces a more favourable restoration of patient biomechanics. We hope that by restoring more normal biomechanics patients will benefit because of reduced energy requirement for walking, and less fatiguing, more stability and less dislocations, and a greater chance of having legs of equal length.

We have had very good results with monoblock-tapered stems however we do feel this is the next generation of cementless THA. We continue to evaluate our clinical results and are conducting mobile gait analysis comparing our clinical outcomes and will report on our findings in the