Results of antibiotic impregnated cement coated IM nail in the management of infected nonunion and compound fractures of long bones.

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Abstract

The aim of study is to analyze the results of antibiotic impregnated cement coated IM Nail in management of infected nonunion and compound fractures of long bones (upto Grade 3A); to assess the effectiveness in eradication of infection, the rate of bony union and the functional return of the limb in the post-operative period. Prospective study. Private Hospital Setup. Intervention: Surgery. A total of 25 patients were included in the study with infected nonunion and compound fractures of long bones (upto Grade 3A) for treatment with this method from August 2013 to May 2017. A minimum of 2.5 years follow up was done to assess the return of the functional outcome of the limb, rate of bony union (According to ASASMI criteria) and effectiveness in eradication of infection. There were excellent results in bony union at the fracture site (except in 3 cases) and excellent results in the functional outcome of the limbs. Control of infection was also achieved in most of the patients (except in 3 cases). Overall, the outcome following this treatment for infected nonunion and compound fracture of long bone was good to excellent.

Keywords: Surgery, IM Nail.

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Introduction

In our study we found that bony union, infection control and functional results are good to excellent. Radical debridement with removal of all sequestrated bone fragment is mandatory before implantation of antibiotic coated IM nail in infected nonunion of long bones. Despite advancements and positive results in fracture treatment, infection rates remain high, particularly in open tibial fractures, and are linked to a major socioeconomic effect and extension of hospitalised stay. Infection rates and overall expenses for in-hospital care could be lowered by up to 15% and 75%, respectively, by utilising an antibiotic-coated nail in patients at high risk of infection, according to a recent study. Craig's meta-analysis highlighted the importance of local antibiotics, revealing that patients with open shaft tibia fractures who received locally delivered antibiotics as prophylaxis in addition to systemic antibiotics had lower infection rates than those who received standard systemic antibiotics. The significance of the Gustilo-Anderson (GA) grade of fracture exposure on infection genesis is consistently agreed upon in the literature: for the most severe instance (GAIII B&C), the incidence of infections reduced from over 31% with systemic antibiotics to under 9% with the addition of local antibiotics. According to the literature, the majority of patients with open fractures from high-energy trauma are men (29 M vs. 9 F) in their third to fifth decade. As a result, infections caused by open fractures are more common in men. The distribution of medial-lateral force is affected by tibiofemoral alignment and varies depending on the weight-bearing task. The medial-lateral weight distribution on the tibia changes during walking. Furthermore, nearly 75% of the joint load Osteoarthritis (OA) is the most common joint condition in adults around the world today. The progressive loss of articular cartilage is accompanied by new bone growth and, in certain cases, synovial proliferation, which can result in discomfort, loss of joint function, and disability. Radiographic evidence, as well as persistent joint pain or stiffness, describe symptomatic OA. Articular cartilage degeneration, primarily in the medial compartment, is the most frequent pattern of symptomatic OA in the knee. With increasing load transmission via the already degenerate compartment, joint degeneration causes a varus deformity. In addition, during walking, knee joint loads and kinematics were shown to be changed in patients with early knee OA. From January 2008 through December 2018, a literature search was undertaken utilising electronic databases, including PubMed, for English-language studies with full text. When the search term "high tibial osteotomy" with full text for humans was used in the PubMed database, 777 papers were found. Although the mean time from trauma to final nailing (TTN) in our study was about 16 days, this appears to be justified due to the complexity of the patients included, who were mostly polytraumatized and required ancillary medical and surgical care (hemodynamic stabilisation, thoracic and/or abdominal surgery), which frequently resulted in a delay in orthopaedic treatment. The average hospital stay in our series is 28 days, with a wide range (from 4 to 128 days); stabilisation within 6–8 hours of arrival in the ER, the timing for definitive fracture treatment is more controversial and less uniform in the literature.

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Based on our prior case studies and a recent study by Franz et al, it appears that gentamicin-coated nails, despite their higher cost, can minimise hospitalisation and the rate of re-operation, particularly in higher-risk open fractures (GAIII). Overall, we were able to achieve complete bone consolidation in 34 of the 38 patients, however 5 of them required nail dynamization. Bone consolidation was achieved in only four patients, one of whom required a two-stage Masquelet intervention for bone infection and subsequent infected pseudarthrosis after revision of the fixation with plate and screws, and the other two patients required a two-stage Masquelet intervention for bone infection and subsequent infected pseudarthrosis (both patients had a grade III fracture according to GA).

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