



E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2021; 7(4): 471-473
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www.orthopaper.com

Received: 13-06-2021

Accepted: 18-07-2021

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Inevitable second Orthopaedic surgery (ISOS)

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DOI: <https://doi.org/10.22271/ortho.2021.v7.i4g.2918>

Abstract

Background: Various situations in orthopedic surgery needed a second surgery. Though the need of a second surgery cannot always be predicted. Despite a well-done procedure, 3.6% cases may still need a second surgery. In modern-day-trauma, with increasing speed-of-travel, we have to face the challenges of 21st-century and rate of Complex-Comminuted-Devascularized-Fractures (CCD) have tremendously increased.

Aim and Objectives: To help identify common orthopedic situations which need a second surgery.

Material and Methods: This retrospective study was carried from 1989-2010, on 25,550-procedures operated at our-centre of total 3060 patients. The study included patients from 5-80 years of age, and excluded surgeries done for congenital and neoplastic disorders.

Results: Out of 25,550 procedures, 3,060 procedures were second surgeries. Indications for the second surgeries were studied and analyzed.

Conclusion: We conclude that this is a revolutionary concept and would help each orthopaedic surgeon across world to classify every fracture with this classification, where they feel need for second surgery. It would improve our rationale of treatment and significantly improve prognosis and final outcomes.

Keywords: Inevitable, Orthopaedic

Introduction

The dictionary meaning of 'inevitable' is something which cannot be avoided. There are various situations in orthopedic surgery which need a second surgery. Though the need of a second surgery cannot always be predicted, a knowledge about the common orthopedic conditions which usually requires second surgery is essential. At the time of initial encounter with the patient's problem, there exists a dilemma as to what would be the best procedure for the given problem in a difficult orthopedic condition. Despite a well-done procedure, 3.6% cases may still need a second surgery.

In modern-day-trauma, with increasing speed-of-travel, we have to face the challenges of 21st-century and rate of Complex-Comminuted-Devascularized-Fractures (CCD) have tremendously increased [1]. At-times, in a highly comminuted-fracture, we have to take course to a method, which makes the situation or the bone survive and then, we plan for the second surgery, for completeness of the-treatment & bringing the patient back-to-function. Second surgery can be broadly divided into complementary, supplementary and staged.

1. The second-surgery may be complementary to the first-procedure, the best-example of this is dynamization required after nailing-procedure.
2. It can be supplementary to the first-procedure, example when for a highly-complex-zone of comminution or bone-loss, secondary bone-grafting is needed.
3. It could be staged where-in sequential surgical-procedures are needed for a difficult situation, for example, in an infected non-union.

The aim of the current study was to help identify common orthopedic situations which need a second surgery [2]. The available knowledge of inevitable second orthopedic surgery (ISOS) would help in selecting common counseling protocols, precise operative planning incorporating the need for second surgery in certain situations [3].

This informed-need of second surgery to patients would help minimize-friction between patients and surgeon and also reduce stress to operating surgeon. The benefit is to make it an expected-event rather than a sudden-nightmare, avoiding mental-trauma to both, surgeon and patients and Improving patient- surgeon relationship.

Material and methods

This retrospective study was carried from 1989-2010, on 25,550-procedures operated at our-centre of total 3060 patients. The study included patients from 5-80 years of age, and excluded surgeries done for congenital and neoplastic disorders. A prior informed-consent was taken from all-participants. Patients' records were analyzed to assess primary orthopedic problem and whether a second orthopedic procedure was required to complete patients' treatment. Patients with a minimum of two years of follow up after the index procedure were included.

Results

Out of 25,550 procedures, 3,060 procedures were second surgeries. Indications for the second surgeries were studied and analyzed, and are as below:

Indication*	Number of Procedures
Biological	748
Biomechanical	629
Infection	314
Idiopathic	250
Iatrogenic	247
Trauma expertise related	225
Technical	195
Metabolic & Hormonal	158
Progressive disease and deformities	110
Scientific	97
Situational	48
Morphologic	39
Total	3060

*Combined causes were observed in 992 procedures.

Discussion

A second surgery in orthopedics is often required for various reasons. No study is available in literature which has been done exclusively to understand need for second surgery. A second surgery could be required to complete the treatment of the patients or to treat a complication from primary surgery. Some situations where second surgery is often required in orthopedics are as follows:

- Intra-capsular-neck-femur fracture with high Pauwel's angle.
- Intra-capsular-neck-femur fracture with late presentation.
- Type VI Schatzker-tibial-plateau-fractures.
- Avascular necrosis of the femoral-head.
- Comminuted sub-trochanteric-fractures.
- Calcaneal or talar fractures.
- Patient with ipsilateral fractures of neck and shaft-femur.
- Young patient with hemi-arthroplasty.
- Infections

An attempt has been made to classify the various-needs & indications of ISOS (Table-1).

At times, to preserve-biology in poor soft tissue condition, a limited initial intervention is done which is later on converted to second surgery, like in cases of tibial condylar fractures with poor soft tissues, an initial spanning external-fixator is applied which is later converted to open-reduction-and-

internal-fixation for tibial-plateau Fractures where initial tibial-stabilization is followed by a second stage- i.e anatomical locking compression plate (LCP).

Scientific

Of interlockings interlock IM nailings for-femur and tibia, in few patients, there is a scientific-justification and need for a second surgery in the form of dynamization.

Technical

There are certain difficult-situations of fracture where the technological-skills are developing and fracture-healing may require second surgery to achieve goals of treatment, for-example in terrible triad and Fixations in growing skeleton allowing bone to grow morphologically.

Morphologic

Occasionally, very thin slender bones may require second surgery to augment healing.

Metabolic and Hormonal

Occasionally bone healing may be retarded in presence of certain metabolic or hormonal disorders and may require second surgery. For example, Osteomalacia, Renal osteodystrophy, Hypothyroidism, Hypo / Hyperparathyroidism.

Biomechanical

At times, both challenges of biology and mechanical stability may herald the need for second-surgery.

Trauma-Expertise-Related

At-times in resource-deficient situations, initial stabilization or treatment is carried out which may require management at higher medical centre with more-resources. Like vascular injuries where primary fracture external stabilization done and later vascular injuries management or patients with complex pelvis-acetabular injuries with hemodynamic instability.

Situational

At-times, because of previous implants, deformities or defects, patient may require a second-surgery.

Idiopathic

Very few of patients may at-times land up with a second-surgery despite a well-done procedure, the cause of which is difficult to postulate with the current available medical-knowledge. Our study demonstrated Idiopathic as a cause in 3.6%

Iatrogenic

Unfortunately, due to iatrogenic factors, some patients have to undergo second-surgery.

Conclusion

We certainly feel there is a need to inform patients with complex fracture patterns about exact prognosis, need for second surgery, time frames and final outcome. We propose ISOS concept and recommend choosing a surgical option with minimum risk to life/ limb/ vessels/ and nerves. ISOS concept will help in choosing /guiding the proper pathway, which is clear and easier, though in stages. It would create informed awareness in the minds of patients about the scientific and justifiable need for second and subsequent surgeries.

We conclude that this is a revolutionary concept and would help each orthopaedic surgeon across world to classify every

fracture with this classification, where they feel need for second surgery. It would improve our rationale of treatment and significantly improve prognosis and final outcomes.

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