

Non-Unions - Why Did It Fail To Heal?

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The crux in deciphering why a fracture fails to progress to union is working out what factors might have influenced a retardation of the natural process. Classifications of nonunions have served to point in a direction of treatment but fail to encompass most of the potential causal variables in the development of a nonunion. Infected nonunions are no different from a fundamental level.

This plenary lecture will look into biomechanical, biological and patient-constitutional variables that influence fracture healing.

From biomechanics we have identified strain as being an important variable but, in the process of learning this, we have forgotten that fractures healed before surgical fixation was commonplace. What was the strain environment then and how was it controlled?

In biology we understand the sequence of changes that produces callus from the initial fracture haematoma. With ever advancing research, we begin to unravel the molecules that dictate the pathways within these changes and, yet, the greatest influence on biology is the energy of injury and the impact of surgical intervention – one within the control of the treating clinician and one not.

And, finally, we are faced with different combinations of constitutional factors which influence healing. Can we alter these to convert an impending nonunion to union?

Infection influences the progress to union not by the presence of bacteria alone – often surgery may be contaminated or even infected but union is achieved - but by the impact of the bacterial processes on biomechanics and biology.

In this summary I will try to present a working algorithm surgeons can use when dealing with fractures that are failing to progress or are non-unions.