Beyond the Fracture: Can the Patient be Optimized?

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• Nutrition and metabolism issues are common and influence:
  – Prognosis for the patient
  – Pre-operative assessment
  – Pre-operative consultations
  – Pre-operative planning
  – Intra-operative decision-making
  – Post-operative care

• Niikura T et. al., Causative factors of fracture nonunion: the proportions of mechanical, biological, patient-dependant, and patient-independent factors. J Orthop Science, 2014
  • 102 consecutive patients with nonunion
  • 24 cases due to mechanical reasons
  • 23 cases due to biological factors
  • 55 cases had combination of factors

  • 251 patients, 37 failures
  • Low serum albumen correlated with fixation failure (p=0.01)
  • Age, sex, side, technique did not

  – Poor Calcium, Vitamin D metabolism
  – Decreased bone density, accelerated bone loss
  – Hormonal changes

• Smith TO et al. “Does bariatric surgery prior to total hip or knee arthroplasty reduce post-operative complications and improve clinical outcomes for obese patients? Systematic review and meta-analysis.” Bone Joint J. 2016 Sep;98-B(9):1160-6

• Brinker MR et al. Metabolic and endocrine abnormalities in patients with nonunions J Orthop Trauma Sept 2007

• 37 patients with “unexplained” nonunion following:
  – Adequate ORIF
  – Multiple low-energy fractures with at least one nonunion
  – Nonunion of undisplaced fracture

• 31 / 37 had a metabolic or endocrine abnormality
  • Vitamin D, calcium, hypogonadism, thyroid, parathyroid
  • Eight united with medical Rx and no further surgery

• Nasell H et al. “Effect of smoking cessation intervention on results of acute fracture surgery: a randomized controlled trial.” 2010 JBJS(A) jun;92(6):1335-42

• Complication rate decreased from 38% (controls) to 20% (intervention), p=0.04

• “Our results indicate that a smoking cessation intervention program during the first six weeks after acute fracture surgery decreases the risk of postoperative complications”

Conclusions

• Metabolic and nutritional conditions are common in your fracture and nonunion population

• You need to know how to recognize these problems and intervene to help these patients

• Bariatric surgery, smoking, female athlete triad, and the elderly are sub-groups at risk

• Carefully planned surgery in a patient with optimized metabolism and biology equals success