Short Communication

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The nomenclature of total elbow arthroplasty

Volume 7 Issue 4 - 2017

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Received: February 11, 2017 | **Published:** February 28, 2017

Introduction

Total elbow arthroplasty is an increasingly common treatment option for unreconstructable distal humeral fractures in the elderly, with a concurrent increase in the associated literature. When attempting to assess the data published in the English. Language, it is apparent that the terminology used to describe total elbow arthroplasty/replacements is inconsistent, which in turn makes direct comparisons of certain design concepts difficult. We attempt to analyse the terminology used in the literature, and suggest an algorithmic form of description.

Materials and methods

We retrieved 192 published English language articles which incorporated elbow arthroplasty/replacement as a primary title or as keywords/mesh words, over a 10 year period, Figure 1+2. Each article was reviewed for descriptive terminology specifically relating to the elbow prosthesis. The terms were then referenced with the Oxford English and the Merriam-Webster engineering dictionaries. The results were grouped according to the descriptive term and the implant being described.

Results

The descriptive terms found are listed below along with their dictionary definitions (Figures 1 & 2).

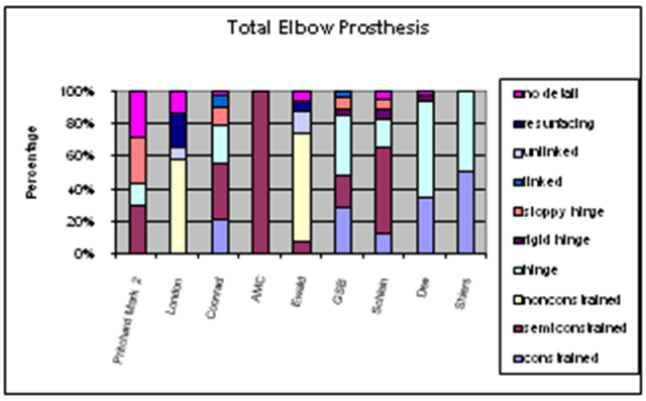

Figure 1 Bar chart depicting the number of articles using the various different descriptive terms over the 10 year collection period, in relation tp a specific implant design.

Discussion

Definitions of constraint

Oxford English Dictionary: A limitation or restriction

Merriam-Webster Engineering Dictionary - Control that limits or restricts actions. The literature uses such terms as "constrained" or "hinged" with little rigor, since both terms have specific definitions and mechanical behavior. Constraint is the limitation of a behavior and in the description of an arthroplasty refers to a structural property that limits the implant's potential for dislocation.

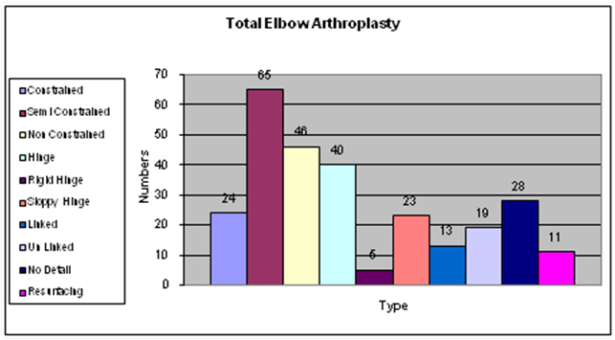

Figure 2 A bar chart depicting the total number of published papers using a specific descriptive term.

Therefore, using the term semiconstrained, unconstrained and constrained has a little real value. A constrained implant would imply a totally rigid connection between the two components, and unconstrained implant would imply there is no resistance to dislocation, and a semiconstrained implant is anything in-between these two extremes. Hence, other than implied mechanical behavior, these terms do not add value from a quantitative sense, and should not be used. The term hinged, rigidly hinged, and sloppy hinge, equally do not add significant value. The only terms that truly added values are linked and unlinked, since they describe a mechanical connection between the two components without implying mechanical behavior. The desire to impart mechanical information, while understandable, is fraught with confusion, especially when trying to compare implants to each other. Terms such as coupled versus uncoupled are intuitive. We recommend only the term linked versus unlinked, as depicted in Figure 3+4, when describing such implants and the term unconstrained not be used at all, since there is no implant that is truly unconstrained (Figures 3 & 4).

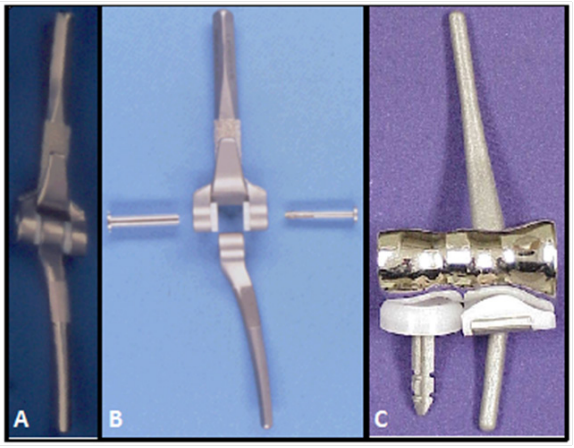

Figure 3 (A)+(B) are the LINKED Coonrad-Morrey arthroplasty, commonly described as a 'sloppy hinge', (C) the UNLINKED Sorbie Questor arthroplasty, commonly described as uncontrained.

Figure 4 A schematic to simplify the useage of descriptive and often inaccurate terms.

Acknowledgments

None.

Conflicts of Interset

None.

Citation: Kamineni S, Kamineni AV. The nomenclature of total elbow arthroplasty. *MOJ Orthop Rheumatol.* 2017;7(4):11–12.
DOI: 10.15406/mojor.2017.07.00281