ABSTRACT INTRODUCTION:
Soft tissue balance is known to be an important factor for the success of Total Knee Arthroplasty (TKA). Traditional surgical techniques involve soft tissue releases and bony cuts to achieve the correct balance. Evaluation of balance is currently based on subjective intra-operative clinical assessment or the ‘feel’ of the knee. More recently, an instrument to objectively measure soft tissue balance following bony cuts has been developed. Soft tissue releases using this instrument may be extensive. Hypothesis: Patients who undergo more extensive releases will have poorer short-term outcome, including range-of-movement, and increased complication rates when compared to those who undergo less extensive releases.

METHODS:
Between October 1999 and December 2002, 506 patients (526 Kinemax TKAs) aged 45-90 years were recruited into a multi-centre prospective study involving seven surgeons from five centres in the UK. Five surgeons used traditional methods for soft tissue balancing and only took balancer measurements pre-cementation. The other two were guided by the balancer instrument and took measurements pre- and post-releases, therefore quantifying how imbalanced the knees were at the beginning of the operation. Patients were assessed by an independent observer using the Oxford Knee Score (OKS), American Knee Society Clinical Rating System (Knee score (KS) & Functional Score (FS)) and the Roentographic and Evaluation Scoring System, with a minimum follow-up of 12 months. Statistical analysis was done using SPSS v 12.

RESULTS SECTION:
In order to test the short-term hypothesis, the data was analysed in 2 different ways. Firstly according to the extent of soft tissue releases performed and secondly according to the amount of soft tissue balance achieved. On analysis there was a significant difference with the change in outcome scores between the none/minimal and extensive releases groups (ANOVA: OKS p=0.029; KS p=0.006 & FS p=0.006, range-of-movement p=0.003).

All surgeons recorded balancer measurements pre-cementation (post releases) and no difference could be seen between the balanced or imbalanced groups related to outcomes. The other two surgeons also recorded measurements after bony cuts (pre releases), quantifying how imbalanced the knees were at the beginning of the operation. There was no significant difference between the change in OKS or range-of-movement (Indep t-test: p=0.112 & p=0.205 respectively). However there was a significant difference with the change in the Clinical Rating Knee and Functional Scores. The knees left imbalanced had substantially lower change scores and interestingly, the knees imbalanced initially but balanced post-operatively showed the most improvement, which was significant (Indep t-test: KS p=0.013, FS p=0.014). Complication rates were low, clinically representative and showed no significant difference between the groups.

DISCUSSION:
The pioneers of Condylar Knee Arthroplasty expressed the view that the correct soft tissue balancing would increase the longevity and decrease revision rates, especially in the challenging group of younger and heavier patients. However, it was felt that too high a price would be paid in the short-term in order to achieve this long-term aim. It has been expressed in the literature that extensive soft tissue releases will increase short-term complications, increasing the joint line resulting in a decreased post-operative range-of-movement and lead to a poorer clinical outcome. Our study has shown this not to be the case. Our results demonstrate that in the short-term, 1) extensive soft tissue releases significantly improve clinical outcome, including range-of-movement, but do not lead to an increased complication rate, and 2) balancing an imbalanced knee significantly improves knee outcome. It remains to be seen whether the hypothesis widely believed, that balancing a Total Knee Arthroplasty will lead to better long-term outcomes, will prove to be correct.

REFERENCES:

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