Knee joint synovitis after total knee arthroplasty is not correlated to patient satisfaction score

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INTRODUCTION:

Total knee arthroplasty (TKA) is an established and effective intervention for advanced OA. However, patient dissatisfaction for persistent pain or failing to achieve good clinical outcomes is common with approximately 20% of patients reporting dissatisfaction following primary TKA, despite a mechanically stable knee joint. Patient dissatisfaction after is attributed to several key factors: patient expectations prior to surgery, the degree of improvement in knee function, and pain relief following surgery. In a recent study in our laboratory, synovitis has been shown to be present at both baseline and 1-year post-TKA and associated with pain. However, patient dissatisfaction was not assessed. The persistent synovitis both pre-TKA and post-TKA in the subset of individuals, could potentially explain patient dissatisfaction and pain. Further to this, it is unknown if synovitis is persistent (>2 years post-TKA) and if it is associated with patient dissatisfaction and adverse outcomes/dissatisfaction (pain, poor functional outcomes, and poor quality of life) post-TKA. The objectives of this research study were to 1) determine the role of synovitis in dissatisfied ³ 2 years post-TKA and 2) to determine if synovitis ³ 2 years post-TKA associated with pain, poor functional outcomes, and poor quality of life.

METHODS:

Study participants ≥ 2-5 years post-TKA with an arthroplasty trained orthopaedic surgeon were recruited. The time point (≥ 2-5 years) post-TKA was chosen as there can be still improvements (pain, stiffness, etc.) in clinical status post-TKA up to 2 years. Satisfied and dissatisfied patients were recruited based off the Knee Society Score Patient Satisfaction rating (satisfaction was determined by ³ 24/40 and dissatisfaction was <24/40). A clinical evaluation (demographics, history of knee symptoms, injury, medication use, height, weight, BMI, and abdominal circumference), 3D ultrasound for synovitis based on the OMERACT knee OA protocol, patient reported outcome questionnaires (Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC)), functional assessment (30 second Chair Stand Test (CST)), and pressure pain threshold (PPT) were completed at the study visit. Spearman correlations were used to determine associations between satisfaction and WOMAC score, CST, PPT, and BMI. Spearman correlations were used to determine associations between satisfaction and overall synovitis and synovitis sub-scores. An independent t-test was used to compare satisfaction between sexes.

RESULTS:

Fifty eight patients (n=32 satisfied and n=26 dissatisfied) were recruited into the study (55% female, average age 70±7.8 years, average BMI 31.6±4.9 kg/m^2). Satisfaction scores were significantly negatively correlated with WOMAC total scores (r=-0.762; p<0.0001; Fig 1), significantly positively correlated with the CST (r=0.5718; p<0.0001; Fig 2), and significantly positively correlated with PPT (r=0.4336; p=0.0015; Fig 3). Satisfaction score was comparable between sexes (p=0.6289) and not correlated with BMI (r=0.021; p=0.8832). Satisfaction score was not correlated with overall synovitis grade (r_S=0.235; p=0.129; Fig 4), hypertrophy/hyperplasia (r_S=0.094; p=0.546), effusion, (r_S=0.096; p=0.537), or power doppler (r_S=-0.079; p=0.537). Further, satisfaction score was not significantly correlated with summed general synovitis score (r_S=-0.0923; p=0.552), regional sum synovitis score (r_S=-0.1759; p=0.254), or the burden of synovitis (r_S=-0.2203; p=0.151). Further, overall synovitis grade was not correlated with the CST (r=-0.0876, p=0.577), PPT (r=-0.141, p=0.366), BMI (r=-0.242, p=0.118), or sex (r=0.0654, p=0.685). Lastly, overall synovitis grade was not correlated to WOMAC total score (r=-0.1978, p=0.204).

DISCUSSION AND CONCLUSION: Patient reported pain, stiffness, and poor physical function at 2 years following TKA was directly correlated to decreased patient satisfaction. However, patient satisfaction following TKA (≥ 2-5 years post-TKA) was not correlated to the presence or burden of knee joint synovitis. Patients who were satisfied with their TKA demonstrated improved functional outcomes and pain pressure threshold (tissue sensitivity). Further characterization of synovitis at a cellular level should be considered in future studies.

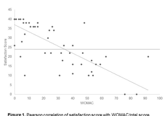

Figure 1. Pearson correlation of satisfaction score with WOMAC total score.

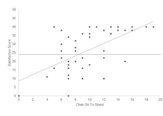

Figure 2. Pearson correlation of satisfaction score and CST.

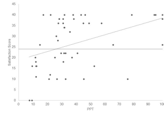

Figure 3. Pearson correlation of satisfaction score with PPT.

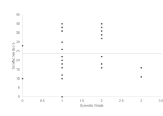

Figure 4. Spearman correlation of satisfaction score with overall synovitis grade.