

# Investigating patient reported outcomes and experience for scarf akin osteotomy using proms2.0

## Abstract

**Background** Patient reported outcome measures (PROMs) and patient reported experience measures (PREMs) are becoming an important part of modern healthcare systems. We report our experience of PROMs 2.0 to assess the patient reported outcomes and experience for scarf and akin osteotomy for hallux valgus correction.

**Patients and Methods:** A total of 350 patients underwent foot and ankle surgery and signed up to the scheme. 97 patients provided complete pre-operative and post-operative data of which 40 had undergone scarf osteotomy and fitted in to selection criteria.

Data collection was performed using Euroqol research foundation derived- EQ-5D VAS and EQ-5D Health Index, and The Manchester-Oxford Foot Questionnaire (MOXFQ). A comparative analysis was done between pre and post-operative data. PREMs data was collected using the Picker Patient Experience questionnaire (PPE-15) postoperatively. Statistical tests carried out were done using the program IBM SPSS Statistics (v2015).

**Results:** Patient demographics- 40 patients (35Female/5Male) (19Left +21Right). Average age- 60.7 years (Range 29-88). No bilateral procedures. 32/40 (80%) patients showed improvement in all three MOXFQ domains. MOXFQ scores showed significant improvement post-operatively. Pain-51.6 (5-100) to 24.4 (0-100), walking-51.4 (0-96) to 22.9 (0-86). Social interaction- 48.8 (0-100) to 23.1 (range 0-88).  $p < 0.05$ . EQ5D improved: index - 0.70 to 0.80 and VAS- 79.3 to 82.9, Index  $p$ -value  $< 0.05$ . PROMs and age correlation shows -Greatest improvement in over 65s for MOXFQ and under 55s for EQ5D. 27/35 women improved in all MOXFQ domains and 5/5 men. PPE questionnaire-average overall satisfaction of 72.9%.

**Conclusion:** The procedure showed very positive patient outcomes. Overall patient experience was satisfactory. Methods to improve patient participation will require development.

**Level of evidence** Prospective case series- Level 3.

**Keywords:** PROMs, Foot and Ankle, Hallux valgus, Scarf osteotomy

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## Introduction

Patient reported outcome measures (PROMs), and patient reported experience measures (PREMs) are becoming a major part of 21st century health care systems. Since 2009, it has been a national requirement to collect this data for the Department of Health. This initially started for elective hip and knee procedures.<sup>1</sup> This is a change from previous years, where outcomes were physician based and used primarily for research purposes.<sup>2</sup> PROMs move us towards a more patient centric healthcare service. The two scoring systems to measure PROMs are:

- The Manchester- Oxford foot questionnaire, a 16-item patient reported outcome-measuring tool.
- The 'Euroqol research foundation' derived- EQ-5D index and EQ-5D Visual analogue scale (VAS). EQ-5D-index is a generic 5-item health status-measuring tool. EQ-5D VAS allows a patient to rate their health on a scale from 1-100. 100 being the best they can imagine, 1 being the worst. The overall EQ-5D score allows comparison of health in general, and when used together allow us to assess the change of perceived patient health post surgery of the foot.<sup>3,4</sup>

Scarf osteotomy has been known to produce very good outcomes in treating hallux valgus.<sup>5</sup> However, there is limited literature on

patient reported outcomes for this procedure.<sup>6</sup> It has been described as safe, giving better aesthetic and functional results than other options for hallux valgus treatment. It is also associated with early recovery and return to work.<sup>6</sup>

It 'achieves good long-term correction with a low incidence of recurrence, footwear restriction or metatarsalgia' this allows early mobilisation, activity and use of normal footwear.<sup>4</sup> A recent study, which focuses on scarf akin osteotomy, emphasizes the importance of patient reported outcomes following surgery, and shows that the procedure is reliable, and can lead to good patient satisfaction.<sup>7</sup> The purpose of our study is to assess PROMs in this procedure, to determine if links exist between outcomes and age/gender. The study emphasizes the importance of PROMs data for first ray surgery and the increasing emphasis for this to be collected as part of health economics. We already are aware that the procedure gives good clinical outcomes; use of patient reported outcomes allows us to look in to another perspective.

## Patients and methods

This is a prospective study looking at patients presenting with symptomatic hallux valgus. Patients reported their outcomes using a semi-automated email based system- Amplitude™. Patients were signed up to the PROMs2.0 scheme, which was set up at various trusts

across the North West of England. Patients undergoing foot and ankle procedures were asked to participate at their pre-op appointments. Once signed up, they would be included in the study, and sent prompts at regular intervals, pre-operatively, and post op 6months to fill in the above questionnaires. The method of communication was by email. This naturally brings up potential challenges that will be discussed later.

**Inclusion criteria-** Patients were required to be fit for general anesthesia, and must have returned pre-operative, and post operative questionnaires.

Overall we had 350 patients who took part in the PROMs2.0 study. This consisted of various foot and ankle procedures, 97 patients responded out of the 350 with pre-operative and post operative PROMs data. Of this 97, 40 patients had undergone scarf osteotomy and these were the patients who were included in this study. Therefore they were not consecutive cases. There was no power calculations involved. The participation rate of 27.7% overall will be discussed later.

Scoring systems, as mentioned above, used to assess PROMs were MOxFAQ and EQ-5D VAS/Index. These scores were compared pre and post operatively.

Picker patient experience data (PPE-15) was collected post-operatively. Patients rated their overall experience of being in hospital, ranging from how queries were answered, passing of information, involvement in decision-making, fears, pains, involvement in care and explanation of medicines. This data was collected and overall positive responses per individual domain were summed up to give a picture of how satisfactory experience was in that particular area.

All procedures were part of a single unit series done between 3 fellowship trained foot and ankle surgeons. Surgery was performed as a daycase procedure. All patients had GA with a local block. This was a medial approached standard procedure with soft tissue release via a separate interspace incision of 1.5cms. Prophylactic antibiotics were given in accordance with the local anti-microbial policy. Weight bearing was allowed post operatively in a heel wedge shoe (DARCO) and all patients were seen at 2 weeks post op for a wound check. At this point patients were advised to maintain active foot and ankle movement. At six weeks physiotherapy was commenced for patients based on radiological and clinical evidence of healing. Regular follow up occurred at intervals of 3, 6 and 12 months (part of study protocol) as the aim of the study was to report on PROMs/PREMs, radiological correction has not been included in this particular study. However on review, there was radiological improvement in all cases.

Statistical tests carried out were done using the program IBM SPSS Statistics (2015) IBM, New York. A p value of 0.05 was considered to be significant giving us 95% confidence limits in our data. We used T-tests to assess the two independent data sets.

## Results

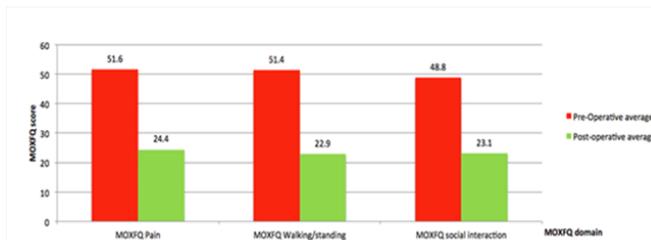
### Patient demographics

40 patients underwent the procedure; 21 were right sided, and 19 left. There were 35 Female and 5 male patients. Average age was 60.7 years (range 29-88yrs). The degree of HVA deformity was grouped according to criteria used in recent papers.<sup>8</sup> Two patients had mild, twenty-three moderate and fifteen patients had severe hallux valgus deformity based on HV angles. There were no bilateral procedures in our cohort. For our PREMs data, we had 40 patients who provided post-operative experience scores.

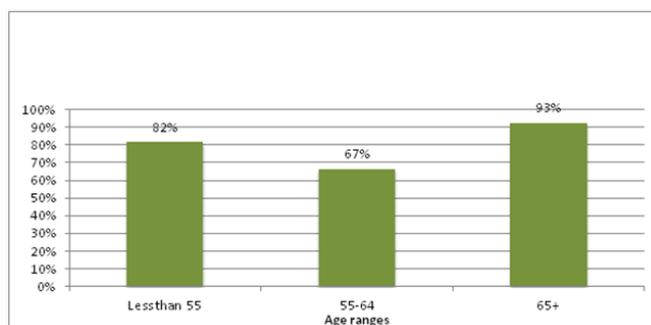
### General trends

80% (32/40) patients showed improvement in all three domains of MOxFAQ. Of 8 who worsened- 6 were worse with pain, 4 with walking and 5 with social-interaction 59.0% (23/39) patients showed improvement in both VAS and INDEX domains.

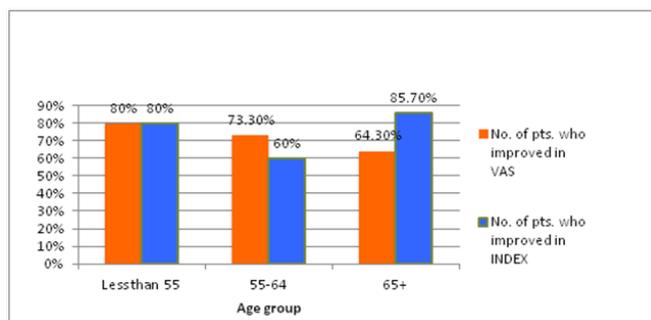
All average MOxFAQ and EQ-5D scores improved (Figure 1). Age and Osteotomy results are enclosed (Figure 2 & 3). Gender and osteotomy- results are enclosed (Figure 4).



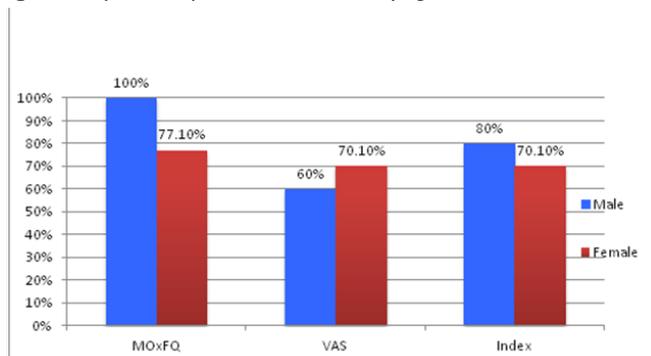
**Figure 1** Pre and Post-operative changes in MOxFAQ domains for 1st MTPJ scarf +/- akin osteotomy.



**Figure 2** Percentage of patients who improved in all three MOxFAQ domains by age groups.



**Figure 3** % patient improvement in EQ-5D by age.



**Figure 4** % of patients who improved in all three MOxFAQ domains and individual EQ5D domains by gender.

PPE-15- results are enclosed for Patient reported experience measures (Table 1) - Average-73.1% satisfaction.

**Table 1** PPE-15 domain

PPE-15 domain	Raw numbers (/40)	Percentage satisfaction
Ability to ask questions	31	77.5%
Sharing of information	35	87.5%
Involvement in care and respect	28	70.0%
Addressing of anxiety and fears	31	77.5%
Pain and its management	22	55.0%
Opportunity to involve family	35	87.5%
Satisfactory discharge advice	29	60.0%

## Discussion

PROMs have changed the way in which healthcare professions assess the standards of the care they provide. They were developed in 2009,<sup>1</sup> as part of a department of health initiative. Their use becomes especially important where survival is not as relevant compared to quality of life.<sup>9</sup> This makes the use of PROMs in Hallux valgus surgery particularly useful. There have been a number of studies looking at PROMs for hip and knee arthroplasty, and factors, which can influence them such as, implant brands and type of hospital.<sup>10</sup> This study allows us to look at demographic factors that impact PROMs as well as the overall patient outcomes for the procedure.

The MOxFAQ scoring system has been used in various studies, one described it as a tool with 'good measurement properties for hallux valgus'.<sup>11</sup> MOxFAQ has been validated for use in foot and ankle surgery.<sup>12</sup> The specificity of MOxFAQ with regards to foot and ankle surgery makes it ideal. However it fails to look at the patient's general wellbeing beyond the foot.

The EQ-5D index and EQ-5D Visual analogue scale (VAS) however do address this. Studies have shown the EQ-5D score to be suitable for our work, being "sensitive to changes in health status at six months"<sup>13</sup> EQ-5D score allows comparison of health in general. The questions asked in are not specific to the foot. One achieves a generic overview of the patient's health when answering these questions. Therefore the use of both scoring systems offers a comprehensive view of PROMs.<sup>3,9</sup>

Overall, there was a statistically significant improvement in patient reported outcomes for scarf akin osteotomy procedures. This suggests that this is a successful procedure. MOxFAQ scores improved significantly, with the greatest average improvement of 28.5 points coming in the walking/standing domain, followed closely by pain with an improvement of 27.2 points and 25.7 for social interaction. EQ-5D scores also showed improvement. The index score improved by a statistically significant score of 0.1. The VAS score improved by 3.6. These scores showed similar levels of improvement to other orthopaedic surgeries, in particular a study looking at 71 cases of combined rotation scarf and akin osteotomies found an average improvement in all three domains for MOxFAQ, and improvements in EQ-5D, similar to our results.<sup>11</sup>

Our MOxFAQ results suggest that patients under 55 and above 65 tend to report the best outcomes.

EQ-5D (combined domains) results varied, as they showed the greatest patient reported outcome improvement to be in the under 55s category alone (80%). This result also carries statistical significance and may be due to the nature of the EQ-5D questionnaire assessing general well being more so than the foot and ankle focused MOxFAQ.

The difference between two EQ-5D domains may be explained by the EQ-5D VAS not being as sensitive as the MOxFAQ and EQ-5D Index score in measuring health changes post operatively.<sup>10</sup> Due to the small sub-groups, it would be difficult to make a conclusion from our results alone regarding age and PROMs however they are in line with published literature that says patient satisfaction increases with age.<sup>14</sup>

For example: Knee arthroplasty research suggests that younger patients, i.e. younger than 55, make the greatest improvement in their surgeries, but are also more likely to be dissatisfied.<sup>12</sup> In addition, it is of note that patients aged less than 40 placed improved walking, reduced pain and the ability to wear dress shoes as the most important outcomes when undergoing Hallux valgus correction surgery. Those between 40-60 placed pain relief as the most important, and over 60s felt improved mobility was the most important outcome.<sup>15</sup>

Results comparing gender differences in scarf akin osteotomy showed all men and 77.1% of women reporting improvement in all three domains of MOxFAQ. This varied for EQ-5D, 70.1% of women improved in both domains, and 60% of male patients. Individual VAS scores were the same as for the two domains combined (above) whilst index scores showed greater improvement in men (80%) compared to women (70.1%) These results are not statistically significant. This is likely due to the low number of male patients in the study. Therefore we are unable to deduce which gender has better outcomes.

A study on how genders perceive important outcomes suggests that women place a greater importance on pain reduction, being able to wear dress shoes and overall appearance than men.<sup>15</sup> This suggests that post-op expectations in men and women vary in hallux valgus surgery.<sup>12</sup>

Overall, 80% of patients improved, accounting to 32/40. The 8 who worsened in MOxFAQ reported- 6 with pain, 4 with walking and 5 with social-interaction. All our patients had radiological improvement, however 6/8 of this group of patients were in the lowest quartile when it came to degree of radiological improvement for Hallux valgus angles. This is an area for potential discussion in further studies.

Patient experience appears to be satisfactory with the greatest satisfaction coming in family involvement and the sharing of information. Pain and its management appears to be the least satisfactory this is something we can target to improve in future.

The limitations of our study are that we had a small cohort of patients. We lost many patients due to a lack of participation in PROMs2.0. There was 27.7% participation in the study. We contacted 30 patients to inform us of their reasons for non-participation. Of the 30 patients, 20 suggested lack of time/forgetfulness, 7 reported difficulty in getting online and 3 did not specify a reason. We can improve participation by offering patient choice of online/paper versions of the questionnaire, and subsequently increasing reminder messages sent to patients when scores are due.

Emphasizing the importance of PROMs is another key step that will improve participation. Patient experience (PREMs) enjoyed greater participation rates than PROMs, perhaps due to the perception that patient experience is more relevant.

It is difficult to enforce patient engagement; we feel educating patients about the importance of PROMs, are it in clinic or via information leaflets, will help participation. Making use of simpler scoring systems is another option, a more simple way to increase participation is to allow patients to do the questionnaires in clinic appointments, and however this puts the data at risk of potential bias.

Further limitations are that we had small numbers of male patients, compared to female, and that having greater number of patients in each age group would have improved our ability to compare PROMs between age groups.

## Conclusion

Scarf akin osteotomy procedures for hallux valgus showed very positive patient outcomes, suggesting the procedure is on the whole very effective at giving good results. Overall patient experience was satisfactory with particularly strong satisfaction in majority of domains. Pain management and discharge advice improvements will lead to excellent PREMs for UHSM. Methods to gather data for online-based questionnaires will need to be improved in order to improve patient participation.

## Informed consent

Informed consent was obtained from all individual participants included in the study.

## Acknowledgments

None.

## Conflicts of interest

None.

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