The Effect of Gender on Hallux Valgus Surgery : A Propensity Score Matched Study

Winston Shang Rong Lim, MBBS, Ming Han Lincoln Liow, MBBS, MRCS Ed, Graham Goh, MBBS, MRCSEd, Bryan Loh, Kevin Koo, FRCS(Orth)(Edin), Inderjeet Rikhraj, MD

Category: Bunion

Keywords: hallux valgus, outcomes, expectation fulfilment, gender, propensity score matching

Introduction/Purpose: Men are recognized to possess higher pain thresholds, report less pain and have a greater tolerance for pain. With increasing numbers of males seeking hallux valgus (HV) surgery, there is a paucity of literature comparing health-related quality-of-life (HRQoL) outcomes and satisfaction between males and females undergoing HV surgery.

Methods: Prospectively collected registry data of 439 patients who underwent HV surgery at a single institution from 2007-2015 were reviewed. Propensity scores generated using logistic regression was used to match males (n=26) to females (n=52) in a 1:2 ratio. Hallux visual analogue scale (VAS) scores, American Orthopaedic Foot and Ankle Society scores (AOFAS), proportion attaining AOFAS minimal clinically important difference (MCID), Short-form 36 (SF-36), satisfaction and expectation scores were analyzed. Hallux valgus (HVA) and inter-metatarsal (IMA) angles were recorded pre- and postoperatively.

Results: Before PSM, there were significant differences in age (49.8±17.4 vs 55.2±11.8, p=0.03) and SF-36 role-physical (37.5±43.7 vs 59.2±42.6,p=0.01)(Table 1). After PSM, there were no significant pre-operative differences in hallux VAS, AOFAS and SF-36 HRQoL scores between groups (Table 1). At two-years, males had significantly lower SF-36 general health scores (68.7±20.6 vs 79.3±17.8, p=0.02) (Table 2). In addition, lower proportion of males reported good/excellent satisfaction (73.1% vs 78.8%) and expectation fulfilment (80.8% vs 94.2%) at two-years (Table 3). Similar proportion of males attained MCID for AOFAS (53.8% vs 46.2%, p=0.63) (Table 4). Males and females presented with similar pre-operative HVA (29.3±8.4 vs 28.2±9.3, p=0.63) and IMA (14.4±3.2 vs 13.9±3.4,p=0.53), with successful correction of HVA (14.7±6.5 vs 12.5±7.8,p=0.25) and IMA (9.4±3.3 vs 8.3±3.1,p=0.17) post-operatively (Table 5).

Conclusion: Our findings suggest that males may experience lower expectation fulfilment when compared to females after HV surgery, despite resolution of hallux pain, satisfactory radiological correction and attainment of similar proportion of MCID in AOFAS scores. These findings highlight that males may possess higher expectations towards hallux valgus surgery. Future research should focus on factors affecting expectation fulfilment in males undergoing HV surgery.

Table 1. Patient demographics before and after propensity-score matching (1:2 ratio)

Before PSM	Male (n=26)	Female (n=412)	p-value
Age (years)	49.8 ± 17.5	55.2 ± 11.8	**0.03**
BMI (kg/m^2)	24.5 ± 4.4	24.0 ± 4.0	0.52
Hallux VAS	4.2 ± 2.6	4.4 ± 2.9	0.75
AOFAS score	56.2 ± 17.2	57.0 ± 16.2	0.81
SF-36 physical function	85.2 ± 11.0	79.7 ± 17.1	0.11
SF-36 role physical	37.5 ± 43.7	59.2 ± 42.6	**0.01**
SF-36 bodily pain	51.0 ± 27.2	52.2 ± 19.4	0.76
SF-36 general health	76.3 ± 22.3	76.1 ± 18.2	0.96
SF-36 vitality	74.6 ± 18.2	73.7 ± 20.3	0.82
SF-36 social function	80.3 ± 31.7	87.0 ± 23.3	0.17
SF-36 role emotional	100.0 ± 0.0	95.3 ± 20.1	0.24
SF-36 mental health	81.7 ± 15.1	84.7 ± 13.8	0.29
SF-36 PCS	44.1 ± 8.4	46.2 ± 9.2	0.24
SF-36 MCS	55.0 ± 10.4	55.2 ± 9.7	0.90

After PSM	Male (n=26)	Female (n=52)	p-value
Age (years)	49.8 ± 17.5	49.3 ± 13.3	0.89
BMI (kg/m^2)	24.5 ± 4.4	24.6 ± 4.3	0.93
Hallux VAS	4.2 ± 2.6	3.8 ± 2.9	0.57
AOFAS score	56.2 ± 17.2	59.4 ± 16.0	0.41
SF-36 physical function	85.2 ± 11.0	81.7 ± 17.3	0.36
SF-36 role physical	37.5 ± 43.7	55.3 ± 44.6	0.10
SF-36 bodily pain	51.0 ± 27.2	51.5 ± 19.6	0.93
SF-36 general health	76.3 ± 22.3	76.0 ± 19.2	0.96
SF-36 vitality	74.6 ± 18.2	71.3 ± 20.5	0.48
SF-36 social function	80.3 ± 31.7	80.3 ± 25.2	1.00
SF-36 role emotional	100.0 ± 0.0	93.6 ± 20.9	0.12
SF-36 mental health	81.7 ± 15.1	85.9 ± 11.7	0.18
SF-36 PCS	44.1 ± 8.4	45.3 ± 9.3	0.57
SF-36 MCS	55.0 ± 10.4	54.6 ± 9.9	0.88

BMI: body mass index, VAS: visual analogue scale, AOFAS: American Orthopaedic Foot and Ankle Society, SF-36 PCS: Short form 36 physical component score, SF-36 MCS: Short form 36 mental component score.

Table 2. Clinical, Patient-Reported and Health-Related Quality-of-Life Outcome (HRQoL) Measures

	Male (n=26)	Female (n=52)	p-value
Hallux VAS	0.5 ± 1.4	0.6 ± 1.8	0.88
AOFAS score	86.4 ± 12.3	87.4 ± 11.2	0.74
SF-36 physical function	89.0 ± 13.3	87.2 ± 14.7	0.60
SF-36 role physical	80.8 ± 31.1	80.8 ± 32.7	1.00
SF-36 bodily pain	68.1 ± 24.2	65.2 ± 23.7	0.61
SF-36 general health	68.7 ± 20.6	79.3 ± 17.8	**0.02***
SF-36 vitality	70.8 ± 18.2	75.5 ± 18.5	0.29
SF-36 social function	98.1 ± 9.8	93.8 ± 16.5	0.22
SF-36 role emotional	96.2 ± 19.6	97.4 ± 11.1	0.71
SF-36 mental health	85.8 ± 10.2	84.7 ± 14.4	0.72
SF-36 PCS	52.9 ± 8.0	51.4 ± 6.7	0.37
SF-36 MCS	53.8 ± 7.2	56.2 ± 9.6	0.26

* $p < 0.05$ = statistically significant

VAS: visual analogue scale, AOFAS: American Orthopaedic Foot and Ankle Society, SF-36 PCS: Short form 36 physical component score, SF-36 MCS: Short form 36 mental component score.

Table 3. Satisfaction and fulfilment of expectations at two-year follow-up

	Two-years		
	Male (n=26)	Female (n=52)	p-value
Satisfied (%)	73.1	78.8	0.58
Dissatisfied (%)	26.9	21.2	
Expectations fulfilled (%)	80.8	94.2	0.11
Expectations unfulfilled (%)	19.2	5.8	

Table 4. Minimal Clinically Important Difference (MCID) attainment at two-year follow-up

	Two-years		
	Male (n=26)	Female (n=52)	p-value
MCID attained (%)	53.8 (14)	46.2 (24)	0.63
MCID not attained (%)	46.2 (12)	53.8 (28)	

Table 5. Radiological outcomes

	Male (n=26)	Female (n=52)	p-value
Pre-operative HVA	29.3 ± 8.4	28.2 ± 9.3	0.63
Post-operative HVA	14.7 ± 6.5	12.5 ± 7.8	0.25
Pre-operative IMA	14.4 ± 3.2	13.9 ± 3.4	0.53
Post-operative IMA	9.4 ± 3.3	8.3 ± 3.1	0.17

HVA: Hallux Valgus Angle, IMA: 1st/2nd Inter-Metatarsal Angle

DOI: 10.1177/2473011418S00077