

Hallux valgus correction by metatarsal osteotomy

PASCOM-10 Working Party

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Anthony Mayer and David Tollafield provide a summary of treatment data held on the PASCOM-10 database at a national level

The PASCOM-10 online audit tool was introduced to the profession in May 2010. It represents a considerable leap forward in auditing the outcomes of podiatry treatment. PASCOM-10 replaced the previous software based system (PASCOM 2000). Since its introduction, PASCOM-10 has registered 31,190 patients and 29,446 episodes of care across 178 centres (system accessed at 16:00 on 24.01.2013). There are 429 registered users ranging from administrative staff to podiatrists of all grades. It is hoped that, with time, PASCOM-10 will become a useful tool for monitoring trends and for benchmarking services at a local level.

The focus in this article is on procedures to correct hallux valgus,* specifically first metatarsal osteotomies. Hallux valgus was chosen as it is perhaps one of the most common surgical complaints presenting to podiatric surgeons.

METHOD

Two members of the PASCOM-10 working party were appointed as national reporters by the College of Podiatry to review the PASCOM-10 database. The system allows national reporters to review anonymous summarised data entered by users across the country. Initially, we generated a report of all surgical procedures performed between 1 June

* A number of procedures that may be used for the correction of hallux valgus or other conditions, most notably osteoarthritis, have been excluded. The excluded procedures are: cheilectomy, exostectomy, Keller's arthroplasty, arthrodesis (1st metatarsophalangeal joint or 1st metatarsal-cuneiform joint). We have not specifically investigated the Akin phalangeal osteotomy, although it is often performed in combination with a metatarsal osteotomy.

2011 and 31 May 2012. This was subsequently sorted and filtered to identify 1st metatarsal osteotomy procedures. We then focused on procedure codes with more than 30 entries (patient treatments) on the database. PASCOM-10 can generate a wide range of reports relating to surgical episodes, however not all reports are relevant or meaningful at a national level. For the purposes of this first national report, we have concentrated on activity levels and outcomes. The reports are generated as lists or tables of data, which are then exported to Microsoft Excel for further data analysis and interpretation.

RESULTS

During the study period, 58 surgical centres contributed data to the system for 8826 patients who were admitted for surgery on 9019 occasions and underwent 13,448 surgical procedures. First metatarsal osteotomies for the correction of hallux valgus accounted for 3693 procedures. A number of different first metatarsal osteotomies were performed (see in Table 1). Mid shaft procedures accounted for 89% of osteotomies. A total

of 3293 scarf (mid shaft) osteotomies were recorded using a variety of procedure codes, the two most frequent scarf codes being: **7.2 scarf osteotomy mid shaft with Akin**, accounting for 1513 procedures; and **7.21 scarf rotational osteotomy mid shaft with Akin**, accounting for 1294 procedures. Table 2 summarises the demographics relating to the three most common procedures.

Thirty six procedures were given unspecified 1st metatarsal osteotomy codes (7.0 and 7.6). Reviewing the free text treatment description entered by the clinician at the time of surgery, it is possible to further evaluate these ambiguous codes. Free text descriptions included 'Austin Youngswick', 'Waterman Green', 'decompression', 'plantarflexory'. Two of the bilateral unspecified codes were used for Chevron osteotomies. Table 1 summarises the 1st metatarsal osteotomy codes entered on PASCOM-10, the incidence of each code and the number of centres contributing data.

ADDITIONAL PROCEDURES

It is not unusual for 1st metatarsal

Location	Relevant PASCOM-10 code*	Osteotomy	n.	Code applied in error (excluded)	Centres contributing data
Distal	7.1, 7.11	Chevron variants	213	3	24
	7.53	Reverdin L	108	-	18
	7.5	Reverdin	5	1	
	7.3	Mitchell	1	-	1
	7.4	Wilson	1	-	1
Mid shaft	7.2, 7.21, 7.23, 7.24, 7.63, 7.64, 7.65, 7.22	Scarf and variants	3293	15	56
Proximal	3.0	Basal	21	10	5
Other	7.0	Unspecified	25	1	17
	7.6	Bilateral unspecified	11	2	3

Table 1. First metatarsal osteotomies recorded on PASCOM (shaded codes were not included in the audit).

Procedure	Female %	Male %	Percentage of patients at working age (16-65)
Scarf	91.4	8.6	74.4%
Chevron	87.3	12.7	76.1%
Reverdin L	91.4	8.6	83%

Table 2. Demographics by procedure

Procedure	n.	Additional procedures	Mean Procedures per patient
Scarf	3293	2007†	1.6
Chevron	216	418	3.1
Reverdin L	108	166	2.6

† This figure does not account for the Akin osteotomies, which were recorded as part of a combined code

Table 3. Additional procedures performed at the same time as the first metatarsal osteotomy

Procedure	n.	Awaiting PSQ	Number of returned PSQs	Mean PSQ score (SD)
Scarf	3293	1204	2010 (61%)	86.5 (12.59)
Chevron	214	93	113 (55%)	82.1 (16.79)
Reverdin L	114	30	78 (68%)	84.9 (15.37)

Table 4. PSQ-10 response, mean scores and standard deviation (SD)

		MOXFQ Domains					
		Mean scores in each domain and standard deviation (SD)					
		Walking Standing		Pain		Social Interaction	
PROCEDURE	n*	WS Pre	WS Post	Pain Pre	Pain Post	SI Pre	SI Post
Scarf	1788	50.5 (23.8)	15.7 (21.5)	55.3 (19.5)	21.4 (19.9)	50.5 (22.9)	11.8 (18.61)
Chevron	93	54.4 (22.7)	27.2 (26.5)	57.3 (20.5)	29.7 (23.6)	49.1 (21.5)	20.1 (25.7)
Reverdin	70	52.9 (22.7)	19.5 (21.4)	58.5 (17.9)	25.7 (21.8)	52.7 (20.8)	13.6 (20.2)

*Only episodes with both pre and post MOXFQ are presented.

Table 5. MOXFQ scores

osteotomies to be performed alongside a number of other procedures. Most notably, an Akin's phalangeal osteotomy is routinely performed as part of the hallux valgus repair. Hammertoe correction is also frequently performed alongside the primary procedure. Table 3 summarises the additional procedures performed alongside the first metatarsal osteotomy. Note: the codes 7.2, 7.21, 7.63, 7.64 are combined codes for recording a scarf osteotomy and Akin's osteotomy as a single procedure.

OUTCOMES

It is important to note that outcome data should be collected at 6 months post-intervention. Therefore, for the 12-month audit period of 1st June 2011 to 31st May 2012, we would expect to see outcome data for half the cohort, i.e. those patients who attended for surgery between 1st June and December 2011.

PSQ-10

For a sample questionnaire go to: <http://www.pascom-10.com/assets/content/07.2%20Patient%20Satisfaction%20PSQ-10.pdf>

The Patient Satisfaction Questionnaire (PSQ-10) asks patients 10 subjective questions retrospectively relating to the

care they have received. Answers to each question are scored and are accumulative, with a maximum possible score of 100. In reality, the maximum score available is highly dependent on the extent of surgery and the associated recovery period. It has been proposed that a PSQ-10 score of 75 or above is acceptable for isolated hallux valgus repair.

For combined forefoot reconstruction a score above 70 is acceptable.¹ Table 4 summarises the PSQ-10 response. The figures presented in this table represent the number of PSQ-10 questionnaires returned in the defined period and are associated with the requested procedure codes. It is not possible to determine whether these PSQ-10 questionnaires relate to surgery performed during or before the study period. Additionally, patients may have returned their PSQ-10 outside of the study period, thus accounting for the small discrepancy between the returned and awaiting PSQ-10 and procedure count in Table 4.

RESPONSES TO SPECIFIC PSQ-10 QUESTIONS

The PSQ report for each procedure code is available on request

Question 2. Were the risks of surgery explained to you?

	Yes
Scarf	98.9%
Chevron	97.3%
Reverdin	98.7%

Question 6. Return to normal footwear by 8 weeks post operation

Scarf	85.5%
Chevron	77%
Reverdin	85.9%

Question 8. How is your original problem?

	Better / much better	Same	Deteriorated	Not stated
Scarf	94.4%	1.9%	2.3%	1.2%
Chevron	86.7%	4.4%	6.2%	2.7%
Reverdin	92.3%	2.6%	3.8%	1.3%

Question 10. Did we meet your expectations?

	Yes	In part	No	Not stated
Scarf	87.6%	9.7%	1.6%	1.1%
Chevron	77.9%	16.8%	1.8%	3.5%
Reverdin	87.2%	9%	2.6%	1.3%

MANCHESTER OXFORD FOOT QUESTIONNAIRE (MOXFQ)

The MOXFQ assesses the impact of foot/ankle pathology on health-related quality of life (HRQOL). The instrument assesses three specific domains: walking/standing (WS); pain; social interaction (SI). Each domain is scored out

Procedure	n.	Episodes with post-op data	Sequelae counts	Episodes with no identified sequelae
Scarf	3293	2188 (66.4%)	607	1306 (59.6%)
Chevron	216	131 (60.6%)	70	75 (57.3%)
Reverdin L	108	84 (77.7%)	18	57 (67.8%)

Sequelae	Scarf	Reverdin	Chevron
Deep vein thrombosis	3 (0.14%)	-	-
Pulmonary Embolism	2 (0.09%)	-	-
Complex Regional Pain Syndrome	3 (0.14%)	-	1 (0.8%)
Avascular necrosis	1 (0.05%)	-	1 (0.8%)
Infection suspected	64 (2.9%)	2 (2.4%)	7 (5.3%)
Infection proven	9 (0.4%)	-	1 (0.8%)
Osteomyelitis	2 (0.09%)	-	-
Metatarsal fracture	28 (1.3%)	-	-
Transfer metatarsalgia	40 (1.8%)	5 (5.9%)	4 (3.1%)

Table 6 (above). Total number of sequelae recorded against each procedure code.

Table 7. Specific sequelae

About PASCOM-10

PASCOM-10 is available for all members of the Society and can currently collect data relating to podiatric surgery (bone and joint surgery), nail surgery and injection therapies. In May 2013 a new development will see PASCOM-10 able to capture data relating to non-invasive podiatry including tissue viability, biomechanics and general podiatry.

- If you are new to PASCOM-10 go to www.pascom-10.com and read the information pages.
- If you are a member of the SCP and wish to join PASCOM-10 go to the training site <http://training.pascom-10.com/> and follow the links to register and complete the online training course.

For further information visit: <http://www.pascom-10.com/information.aspx>

of 100, with high scores representing poor quality of life and low scores representing improved quality of life. The instrument is validated for use in a range of foot and ankle conditions.² Further details on the MOXFQ can be found on the official website: <http://www.isis-innovation.com/outcomes/orthopaedic/moxfq.html>

Minimal clinically important differences (MCID) have been estimated for each of the MOXFQ domains. The MCID is a measure of the smallest amount of change in health status score that patients can detect. The MCID estimates are 16 for walking /standing, 12 for pain and 24 for social interaction.³ It can be seen in Table 5 that the MCID estimates have been exceeded in each of the domains for each of the three osteotomies.

SEQUELAE FOLLOWING HALLUX VALGUS SURGERY

Users may enter all post-operative data contemporaneously, or alternatively data may be entered at a defined period in the future, usually at a 6-month post-operative check. As such, when running reports for the defined date range we would expect to see post-operative data (including complication records) for a minimum of 50% of the cohort. Table 6 summarises the number of post-operative episodes and sequelae counts recorded in the study period.

When reviewing sequelae, the following points should be considered: Although the incidence of sequelae can be assessed, at a national level the system cannot determine how many patients were affected by each complaint; a single patient may potentially suffer multiple

adverse events, resulting in lower grade concerns (sequelae) or events with greater concerns (complications). There is also evidence of duplication occurring with users entering the same sequelae data on repeated occasions for the same patient. The system partially corrects for this, but further software measures may be required to forcibly prevent the entry of duplicate post-operative data.

Please refer to the PASCOM-10 guidance document (available at <http://www.pascom-10.com/information.aspx>) for a further explanation of post-surgical sequelae.

SPECIFIC SEQUELAE

PASCOM has the ability to record 51 individual sequelae, ranging from relatively mild and short-lived ailments, e.g. steroid flare, through to life changing events, e.g. Complex Regional Pain Syndrome (CRPS). Table 7 lists some of the most serious sequelae associated with foot surgery. The available sequelae data presented in Table 7 should not be relied on for benchmarking local outcomes for two reasons. Firstly, sequelae may have been under reported and this cannot be tested for. Secondly, data are missing for more than 40% of the cohort as explained above. It is recommended that PASCOM-10 users review their own data locally and compare to previously published sequelae rates. A useful reading list can be found on the [feetforlife.org](http://www.scpod.org/foot-health/foot-surgery/about-podiatric-surgeons/) website: <http://www.scpod.org/foot-health/foot-surgery/about-podiatric-surgeons/>

DATA COLLECTION ERRORS

The PASCOM-10 system is still in active

development and this report has highlighted some areas for the working party to focus on. Errors may occur at various stages of inputting by users. We have found several instances of procedure codes not matching the free text description of the procedure; this is perhaps one of the most significant errors caused by users. Entering the wrong procedure code invalidates data.

At a national level, when handling anonymous data it is impossible to know how often such errors are made and many may be hidden behind vague free text descriptions such as 'foot surgery' or 'HAV' repair. It is possible for national reports to detect errors, but these must subsequently be amended locally. Post-treatment 'events' are at risk of a number of errors. Duplication of sequelae is possible if users enter data contemporaneously. Equally, sequelae may well be under reported if data are entered retrospectively.

Loss to follow up is a problem with any audit system. Determining the extent of such loss is difficult at a national level. Reviewing a 12-month period provides a snapshot of activity, but cannot accurately determine loss. At a local level, users can run various reports to monitor loss to follow-up and recall missing patients.

REFERENCES

1. Tollafeld D. Osteotome Spring Foot Surgery Conference, Cambridge 2007.
2. Dawson *et al.* The MOXFQ patient-reported questionnaire: assessment of data quality, reliability and validity in relation to foot and ankle surgery. *The Foot* 2011; **21**: 92-102.
3. Dawson *et al.* Osteoarthritis and Cartilage 2007; **15**: 918-931.