Satisfaction with conduit harvest site scars in coronary bypass surgery

CS Hill,¹ J Shepherd,² I Birdi³

¹National Hospital for Neurology and Neurosurgery, London, UK

²Queen Elizabeth Hospital, London, UK

³Essex Cardiothoracic Centre, Basildon University Hospital, Basildon, UK

ABSTRACT

INTRODUCTION Scars from conduit harvesting are common in coronary artery bypass patients. As an outward manifestation of surgery, the scar is important in patient perception of operative success and quality of care received. The aim of this study was to determine patient satisfaction with scars from radial artery and saphenous vein harvests at a tertiary cardiothoracic centre.

METHODS We surveyed 62 patients attending follow-up appointment using the Patient Scar Assessment Questionnaire. This is a reliable and valid measure of a patient's perception of scarring. Data were analysed using ratings of scar attributes and features. We compared findings according to site and patient choice of scar site using the Mann–Whitney U test.

RESULTS Analysis of both global and summative ratings showed no overall statistical differences between arm and leg scars ($p < 0.05$). However, patients given a choice gave significantly higher ratings of scar appearance on global ratings versus those given no choice. Patients also reported greater satisfaction with appearance than those given no choice on summative ratings ($p < 0.05$).

CONCLUSIONS Patient choice of conduit site is an important determinant of the overall rating of scar appearance. Overall satisfaction is influenced by scar appearance. Clinicians should ensure, wherever possible, that they involve patients in conduit site selection.

KEYWORDS

Coronary artery bypass – Radial artery – Saphenous vein – Cicatrix – Personal satisfaction

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CORRESPONDENCE TO

Ciaran Scott Hill, Neurosurgical Specialty Trainee, National Hospital for Neurology and Neurosurgery, Queen Square, London WC1N 3BG, UK.
E: ciaran.hill@uclh.nhs.uk

Coronary artery bypass surgery is the most common cardiothoracic operation performed worldwide and harvest site scars are almost ubiquitous in coronary artery bypass patients. They result from conduit extrication and commonly involve a near-linear incision over the radial artery, long or short saphenous vein territories. As one of the only outward manifestations of coronary artery surgery, the scar may be important in patient perceptions of operative success and the quality of care received. No work has previously addressed the issue of determinants of patients' satisfaction in relation to harvest scars and the possible influence of scar site choice on patient perceptions.

The goal of coronary bypass (revascularisation) surgery is to provide long-term perfusion in the native coronary arterial system. This is dependent on a functioning secure graft that remains patent over time. The choice of conduit is traditionally based on the site of obstruction, factors such as diameter and length of conduit required, co-morbidities and the accessibility and availability of autologous conduits. The maintenance of competitive flow is frequently the greatest concern to a surgeon.

There are numerous sources of conduits that can be used. The most common grafts requiring a separate limb in-

cision are the long saphenous vein and radial artery. Saphenous vein grafts are easily accessible but may be unsuitable due to varicosities or a size mismatch with the coronary vasculature. They have good early patency rates but in the longer term failure is still not uncommon. Radial artery conduits are easy to handle, often of a good diameter to match coronary vessels and have a good length. They may be unsuitable in patients with peripheral vascular disease where there is poor ulnar collateral perfusion to the hand and forearm. The graft is also mechanically quite sensitive and liable to spasm. Radial conduit patency rates vary widely between different studies. Their choice as an initial conduit is not uncommon but remains controversial.¹

The aim of this study was to determine the satisfaction of patients with the scars from radial artery and saphenous vein harvests at a regional tertiary referral cardiothoracic centre. This work also explored the factors that correlate with satisfaction, including scar site, choice of scar site and scar features. Specifically, we aimed to ascertain if satisfaction varied between those given a choice and those not. This is an area of clinical equipoise. We also aimed to determine as an absolute whether our cohort of patients had a higher satisfaction with radial artery (arm) or saphenous vein (leg)

scars. The study intended to resolve which scar factors in particular determine scar satisfaction and if any of these can be influenced by our management. We hoped that by clarifying determinants of scar approval we could maximise patients' experience and satisfaction.

Methods

This study involved surveying all coronary artery bypass patients who attended six-week follow up with our service over a three-month period. The surgical technique used in all these patients was standard open conduit harvesting with either electrocautery or clip ligation. Skin closure was with a standard straight needle and absorbent monofilament suture.

A cohort of 62 patients replied to a scar survey questionnaire from a total of 100 that were distributed by an independent nurse practitioner. The administered questionnaire was the Patient Scar Assessment Questionnaire.² This is a reliable and previously validated Likert scale for measuring patient perception of scarring. It consists of five subscales: appearance, symptoms, consciousness, satisfaction with appearance and satisfaction with symptoms. Each subscale has a set of items with four or five categorical responses (1 being the most favourable and 4 or 5 being the least favourable), including one global assessment item not included in the summary subscale score.

The following additional information was obtained separately from the main questionnaire:

- > Where is the site of the scar/s?
- > Was the patient given a choice of scar site? If not, what was the reason? (eg varicose veins, poor Allen's test, previous vein surgery etc)

Data from the Likert scale were assessed using SPSS® (SPSS Inc, Chicago, Illinois, US). Mann-Whitney U tests were applied to answer the null hypotheses that:

- a. There is no statistical difference ($p < 0.05$) in satisfaction characteristics (and global satisfaction) between those subjects who received leg or arm scars.
- b. There is no statistical difference ($p < 0.05$) in satisfaction characteristics (and global satisfaction) between those subjects given a choice of scar site and those not.

This study has the biases inherent to many satisfaction surveys; these include the potential of a responder and recall bias. The documentation of scar site choice as part of a standardised consent protocol would have been reassuring. The sample was an opportunity sample as opposed to a truly random selection and therefore may contain hidden confounders. However, there was no known selection bias.

Results

Of the 62 respondents, 5 were eliminated from the analysis due to having scars in both arm and leg territories, and 1 due to no record of whether that patient had a choice of scar site and what the actual site of the scar was. There was no evidence of anticipation bias. Of the questionnaire sub-

scales, the symptoms subscale was eliminated from analysis as the authors of the original questionnaire found this to be unreliable in the case of linear scars. Therefore, 56 patients (44 male, 12 female) and four subscales were used in the final analysis. The mean patient age was 66.7 years.

The median scores of global ratings and summative subscale totals are shown in Tables 1 and 2. Summative scores

TABLE 1 Median scores for global subscale ratings

Subscale	Range of possible scores	Median (range)
Appearance	1 (Excellent) 5 (Very poor)	2 (1–3)
Consciousness	1 (Not at all self-conscious) 4 (Very self-conscious)	1 (1–4)
Satisfaction with appearance	1 (Very satisfied) 4 (Very unsatisfied)	2 (1–3)
Satisfaction with symptoms	1 (Very satisfied) 4 (Very unsatisfied)	2 (1–4)

were rescaled to a universal scale of 1–20 for the purposes of data representation. Breakdown scores according to scar site and patient choice are shown in Tables 3 and 4.

According to scar site, Mann-Whitney U test analysis of both global ratings and summative subscale scores supported the null hypothesis that there were no statistical differences of patient perception of scar outcome between arm and leg scars on all subscales at $p < 0.05$. However, when analysed according to patient choice, we found that patients given a choice reported significantly higher global ratings of appearance (median 'excellent', $n=9$) compared with those given no choice (median 'good', $n=42$) at $p < 0.05$. In addition, analysis of summative subscale scores found that patients given a choice had a higher satisfaction with appearance (median 3.38, $n=9$) compared with those given no choice (median 7.33, $n=42$) at $p < 0.05$. No statistical differences were noted on the other subscales.

Of the 52 patients for whom there was a record of whether they had a choice of conduit site, 9 (17%) reported being given a choice. Five were not given a choice due to a clear contraindication such as varicose veins, leaving 38 patients (73%) who were not given a choice despite not having a clear contraindication.

Discussion

To our knowledge no previous studies have addressed the issue of patient choice in conduit site selection or compared satisfaction between radial artery and saphenous vein scars in patients undergoing coronary bypass operations.

We found that patients generally perceived their scar outcomes to be favourable on global ratings of all subscales. Although scar site appeared to make no statistical difference to perception of scar outcome, we found that patients who had been offered a choice gave more favourable scar rat-

TABLE 2 Median scores for summative subscale ratings

Subscale	Range of possible scores	Median (range)	Rescaled range of possible scores*	Rescaled median (range)
Appearance	9–36	18 (11–29)	1–20	6.38 (1–15)
Consciousness	6–24	11 (6–19)	1–20	7.33 (2–15)
Satisfaction with appearance	8–32	16 (8–23)	1–20	7.33 (1–13)
Satisfaction with symptoms	5–20	9 (5–15)	1–20	6.07 (1–14)

* where '1' represents the most favourable score and '20' represents the least favourable score

TABLE 3 Median scores for summative subscale scores according to scar site and patient choice

			Summative subscale median scores (rescaled)			
Scar parameters		<i>n</i>	Appearance	Consciousness	Satisfaction with appearance	Satisfaction with Symptoms
Scar site	Total	54				
	Arm	13	8.04	6.28	7.33	7.33
	Leg	41	7.33	7.33	6.54	4.80
Patient choice	Total	52				
	Choice	9	7.33	6.28	3.38*	6.07
	No choice	43	8.04	7.33	7.33*	7.33

* $p < 0.05$

TABLE 4 Median scores for global ratings according to scar site and patient choice

			Global rating median scores			
Scar parameters		<i>n</i>	Appearance	Consciousness	Satisfaction with appearance	Satisfaction with Symptoms
Scar site	Total	54				
	Arm	13	2	1	1	2
	Leg	41	2	1	2	1
Patient choice	Total	52				
	Choice	9	1*	1	1	1
	No choice	42	2*	1	2	2

* $p < 0.05$

ings. It therefore appears that patient choice plays a role in overall perception of scar outcome and this should be reflected in clinical practice. Importantly, however, our study also showed that 73% of patients who were not given a choice had no clear contraindications explained to them to exclude this option.

The limitations of this study include the biases mentioned above. In addition, the small sample size means it was difficult to extract other parameters of scar satisfaction (eg length, width, redness, height) that may play a specific role. Furthermore, as the questionnaire was delivered relatively soon after the operation, patients may have rated their scars differently in the future. The majority of healing oc-

curs in the first six weeks and most scar-related complications would have been identified by this point. Nevertheless, it is true that scars can continue to mature for up to several years. Similarly, it seems likely that a patient's relationship with his or her scar might change over time depending on life circumstances. It would be interesting to explore changes in patient perception over time and whether there is a relationship to the perceived magnitude of the operation. Lastly, our results cannot be generalised for minimally invasive harvesting techniques.

Choice of conduit is a complex process involving a multitude of factors including conduit factors (eg patency rates of arterial vs venous grafts), patient factors (eg diabetes, age, varicose veins, arterial disease) and the surgeon's techni-

cal experience. Patient preference (eg arm, leg, right or left side) is typically not considered a frontline parameter in this process. However, research has not always been conclusive as to the relative effectiveness of different conduit types (in terms of graft longevity and patency) in different patients.¹ Thus, in cases where there is no clear indication or contraindication to using a particular site, it seems reasonable, given our findings, that patients should be involved in making this selection. This could include a patient leaflet given preoperatively outlining the conduit selection process. At the very least, patients should have clear explanations as to why a particular site is regarded as clinically more suitable. Documentation of whether the conduit site was discussed with the patient during the consent process may also be a prudent recommendation.

The importance of patient perceptions of their scars is reflected in studies comparing patient preference for minimally invasive harvest techniques versus the open technique.³ In such cases, the strong preference of patients for the minimally invasive techniques has meant that the technique has been advocated despite equivocal clinical outcomes.³⁻⁵ We argue that where there is no clear clinical indication to preclude patient choice, a choice should be provided due to its potential to enhance patient perceptions of scar outcome and therefore their overall experience.

Future research could employ larger samples to validate findings of this work and further explore individual scar

factors affecting perceptions of scar outcome. This may include male-female differences. A larger sample may also appropriate the use of parametric testing of the summative subscale scores (provided results follow the normal distribution), which may provide more sensitive analyses.

Conclusions

This study demonstrates more favourable perceptions of scar outcome when patients are given a choice of conduit site. We recommend that, where possible, patients are involved in the process of conduit selection.

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