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Resource implications of bilateral autologous breast reconstruction – a single centre's seven year experience☆,☆☆

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Summary *Introduction and aims:* Since the recent introduction of ''Payment by Results'' as part of NHS financial reforms, it has been noted that there is an imbalance between allocated Healthcare Resource Group tariffs and actual resource use for certain procedures. This study was undertaken to assess the impression that bilateral breast reconstruction using autologous flaps is under-funded.
Material and methods: Patients who underwent bilateral flap breast reconstruction following mastectomy between 2000 and 2006 at Addenbrooke's University Hospital were identified. Resource cost analysis for each patient was based on the following parameters: number of operating consultants, theatre running costs, and length of hospital stay. The estimated hospital costs were then compared to the national tariff for the Healthcare Resource Group ''Complex Breast Reconstruction using Flaps''.
Key results: Over the 7-year period 24 patients underwent bilateral flap breast reconstruction (7 paired latissimus dorsi and 17 paired abdominal flaps). The mean operative time was 9.4 h (£4.5/min), the mean hospital stay was 10 days (£150/day) and ten patients required 2 consultants (£34/h) operating. The average total cost equated to £5 492.
Conclusion: The allocated tariff of £4 053 is insufficient, even before the inclusion of hidden costs. Bilateral free flap breast reconstructions are grossly under-funded at present. With increasing financial pressures on NHS Trusts there may be a drive towards simpler operations, which receive proportionally greater remuneration.
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With the increasing incidence of breast cancer, development of screening programmes, knowledge of genetic risk factors and patient awareness, bilateral mastectomies are increasingly performed.[1] General indications for bilateral mastectomies include bilateral breast cancer, unilateral breast cancer with contralateral mastectomy for prophylaxis or premalignant disease, and bilateral prophylactic mastectomies. Bilateral reconstructions may also be required to revise previous unsatisfactory reconstructions. Thus, a significant number of women requiring bilateral breast reconstructions consult plastic surgeons each year.

In tandem with increased awareness of breast cancer there is a growing public knowledge of breast reconstruction options. Many women know someone who has undergone breast reconstruction or have informed themselves from magazines, books or the Internet. An increasing proportion present to outpatient clinics with definite ideas and expectations regarding their surgery. The aim of reconstruction is not merely to recreate the breast mound but also to achieve symmetrical, soft, aesthetically pleasing breasts.[2,3] This is now widely acknowledged as the best accomplished with autologous tissue.[4] In particular, younger mastectomy patients with a good long-term prognosis may wish to avoid implant reconstruction, knowing the risk of developing prosthesis-related complications over several decades.[5]

Suitable patients often prefer to have their reconstruction performed at the time of mastectomy - which has been shown to have both psychological and aesthetic benefits.[6,7] However, bilateral breast reconstructions can be major, labour-intensive procedures with prolonged recovery times, especially when they incorporate bilateral mastectomies and two free tissue transfer operations in a single session. In addition to implications for the patient, these operations have financial consequences for the hospital involved.

As part of recent National Health Service (NHS) financial reforms, Payment by Results (PbR) was introduced in 2002 to provide greater transparency and consistency in NHS spending.[8] PbR means that the hospital Trust is paid for each patient ''spell'' (time from admission to discharge). Patient spells are coded according to the reason for admission, and then similar spells are grouped together into Healthcare Resource Groups (HRGs). The hospital is reimbursed by the Primary Care Trusts (PCTs) for each HRG at a nationally agreed tariff. This system rewards hospitals that are able to carry out procedures at costs lower than the pre-determined tariff - it is therefore hoped that this will promote efficiency. Currently patients who undergo unilateral or bilateral, free or pedicled autologous breast reconstructions are all coded into the same broad HRG ''Complex Breast Reconstruction using Flaps''. Thus a set tariff is reimbursed for each patient, irrespective of their co-morbidities, type of flap reconstruction and length of stay. The only supplementary revenue that can be claimed is a daily top-up fee for patients whose inpatient stay exceeds the 12-day threshold associated with this HRG.

Since the introduction of PbR both clinicians and managers have observed some discrepancies between the actual costs and the tariffs reimbursed to Trusts for certain procedures. Further refinements to the system may therefore be required. In our hospital it has been noted that an increasing number of free tissue transfers are being performed since the arrival of the senior authors to the unit. We therefore chose to examine the resource costs of bilateral flap breast reconstruction to evaluate whether the present allocated tariff is adequate.

Patients and methods

We retrospectively studied all patients who underwent bilateral breast reconstructions over a seven-year period from the start of 2000 until the end of 2006 at Addenbrooke's University Hospital, Cambridge. Patients who were reconstructed solely using implants were excluded, as the HRG under evaluation specifies ''Complex Breast Reconstruction using Flaps''.

Following discussion with the hospital costings department, the most objective way to estimate key expenses was to calculate the cost of theatre time (including cost of theatre staff), the cost of consultant plastic surgeons and the cost of hospital stay. Theatre time was calculated from the time the patient entered the anaesthetic room until the time the patient left the operating room. The calculation was based on average theatre running costs per minute, which included staffing. Consultant pay was estimated according to the number of hours required for each procedure. The cost of hospital stay per day was based on average costs provided by the costings department.

A number of additional expenses were more difficult to ascertain such as investigations, hospital overheads, cost of breast surgeons and junior doctors. At Addenbrooke's a new system of ''patient level'' costing is currently being introduced. This allows a ''hotel bill'' to be generated for each patient encompassing all these additional costs. Using this system the actual cost of the most recently studied patients' treatment was calculated more accurately.

Results

During the study period (2000—2006) 24 patients underwent bilateral autologous breast reconstructions. Their mean age was 47-years, with a range between 36 and 68-years. There were a total of 48 flaps performed, of which 20 were pedicled flaps and 28 were free tissue transfers. Ten of the 24 study patients (all of whom had free flaps) required two consultant plastic surgeons operating simultaneously. In all but four patients the reconstructions were carried out at the same time as the mastectomies, which were all performed by a consultant breast surgeon.

Seven patients had bilateral latissimus dorsi (LD) flaps, which required a mean theatre time of 6.2 h and a mean hospital stay of 9.1 days. Three patients had bilateral pedicled transverse rectus abdominis myocutaneous (TRAM) flaps, with an average operating time of 6.2 h and inpatient stay of 10 days. In the free flap group of 14 patients, which incorporated mainly deep inferior epigastric perforator (DIEP) flaps but also TRAM and superficial inferior epigastric artery (SIEA) flaps; the mean theatre time was 11.6 h and mean hospital stay was 10.2 days (Table 1).

One free flap patient was re-explored in theatre twice, firstly for arterial thrombosis (necessitating re-anastomosis) and subsequently for bleeding. A second patient required

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