Panning for gold: screening for potential live kidney donors

Francis R. Calder and Rene W. Chang

Department of Renal Medicine and Transplantation, St George’s Hospital, London, UK

Abstract

Background. Living donation is one method of addressing the gulf between supply and demand for kidney transplants. However, few manage to complete the extensive work up procedure. This study reviews the reasons for failure to complete the live donor renal assessment and suggests options, which may improve the situation.

Methods. Retrospective analysis of data collected over 5 years between 1997 and 2001 of all potential live donors entering the assessment programme.

Results. 189 (103 female, 86 male) potential donors entered the assessment process. Thirty-four (18%) actually donated comprising 17 (50%) siblings, nine (26%) parents and eight (24%) unrelated donors. Of the 155 who did not donate, 46 (30%) had blood group or immunological incompatibility and 42 (27%) withdrew. Twenty-three (15%) were medically unfit, mostly due to cardiovascular disease and 16 (10%) had insufficient renal function for safe donation.

Conclusion. Live donor transplantation offers an attractive source of high quality organs, but considerable time and effort is required to realize this. Manipulation of immunological incompatibility, psychological assessment and counselling of those likely to withdraw may significantly enhance the yield. Support should also be provided for those unable to donate for whatever reason.

Keywords: live kidney donation; renal transplantation; screening

Introduction

In the UK there has been a 31% increase in patients waiting for renal transplantation between 1992 and 2001 [1]. However, the major source of organs, heart beating cadaveric donors is declining due to a reduction in road traffic accidents, terminal intracranial haemorrhages and insufficient intensive care facilities [2]. Live donor transplantation offers an alternative source of organs, and has become established in the US and many European countries such that it now contributes over 30% of all renal transplant activity [3]. Currently in the UK, living renal donor transplants comprise 21% of the total transplant activity, an improvement of 4% on the year 2000 [1]. However, the yield of successful live donors from those entering the rigorous work up process is disappointingly low. We report 5 years experience of live donor transplantation at St George's Hospital with particular reference to the reasons for failure to complete the assessment and suggest pathways to improve this situation.

Subjects and methods

The data is obtained from an ongoing database collected on each potential donor entering the work up process (even if they withdraw after the initial interview with the transplant coordinator without any investigation).

The prospective live donor is assessed along guidelines published by the British Transplant Society in 2000 [4]. The process is designed to take a minimum of 3 months, to allow the donor sufficient time to fully contemplate the undertaking.

There are a number of stages in the work up. (i) The transplant coordinator meets with recipient and discusses the live donation option as part of general recipient evaluation. It is left to the recipient to initiate discussions with any potential donor who would then contact the transplant coordinator voluntarily. (ii) Initial discussion with transplant coordinator and blood grouping of potential donor. (iii) The potential donor meets with the transplant coordinator and a nephrologist (who is independent from the physician caring for the recipient) to further discuss the procedure and proceed with clinical examination and investigations: blood pressure, CXR, ECG, haematology–renal–hepatic–bone profiles, tissue typing and cross-match, urine analysis, renal ultrasound and EDTA GFR estimation. Absolute medical contraindications to donation are: body mass...
index >35 kg/m², more than two renal arteries; GFR <80 ml/min/1.73 m², hypertension with end organ damage, most malignancies, diabetes mellitus, pregnancy, i.v. drug abuse, thrombophilic conditions, major cardio-respiratory disease; HIV positive, psychiatric disorders, systemic disease with renal involvement and renal disease [including multiple (more than three) cysts and stone disease]. (iv) Case reviewed by transplant team before proceeding to angiography. (v) The transplant surgeon reviews donor and recipient individually and together. (vi) The transplant team reviews case and date for surgery is given. (vii) Repeat flow cytometric cross-match 2 days before surgery.

The progress of any work up is also discussed at the monthly transplant meeting. Many potential donors come from abroad with some investigations already completed. For these individuals the work up process is often condensed into <3 months.

The Human Organ Transplantation Act 1989 [5] defines those genetically related to the index person as: their natural parents and children; their brothers and sisters of the whole or half blood; the brothers and sisters of the whole or half blood of the natural parents; the natural children of their brothers and sisters.

Out-with these relationships the clinician responsible for the donor must make an application to the Unrelated Live Transplant Regulatory Authority (ULTRA) who will investigate the case to ensure the legal requirements of the Human Organ Transplant (Unrelated Persons) Regulations 1989 have been satisfied [6].

If at any stage the potential donor wishes to withdraw, then a further meeting is arranged to try to ascertain the reasons. On occasions a ‘face saving’ medical alibi not to donate has been given when requested by the donor. We believe this to be perfectly in keeping with the ethos that the potential donor can withdraw at any time. Simmons et al. [7] found that a significant number of potential donors experienced direct and indirect pressure to donate although this was not communicated to the medical staff.

Results

Transplant activity

Figure 1 shows the transplant activity at St George’s Hospital since the Live Donor programme was commenced in late 1996. In 2001, live related donation comprised 17% and live unrelated 6% of the total transplant activity.

Donors

Between 1997 and 2001, 189 potential live donors were seen for assessment of live renal donation (103 females and 86 males). The relationship between all donors and recipients is shown in Table 1. Thirty-four (18%) of the potential live donors seen actually donated—17 (50%) were siblings, nine (26%) parents and eight (24%) were unrelated. Of those being worked up, male donors were more likely to actually donate than female, although this was not statistically significant ($\chi^2$ 1.24, $P > 0.05$).
The local population is ethnically diverse, hence 55 (29%) donors come from abroad for assessment.

Reasons for non-donation

Table 2 shows the reasons for non-donation, which may be classified as either fixed or modifiable. Of the 155 who did not donate, immunological problems (positive cross-match or blood group incompatibility) combined accounted for 46 (30%). However, voluntary withdrawal [42 (27%) patients] was the commonest single reason for non-donation. For this group 28% cited work commitments, 28% had a ‘change of mind’ (often after consulting with their partners), 19% feared the risks of operation, 10% were planning a pregnancy and 15% did not wish to give a reason. In 13 (8%) cases the recipient received a cadaveric transplant whilst the potential live donor was undergoing the work up process. Eight (6%) patients were transferred to another unit, and in five cases (3%) the potential donor was deemed unsuitable for a live donation after review by the transplant surgeons—all these individuals had prior complex abdominal surgeries.

Medical reasons for non-donation

See Table 3. There were 23 patients who were unable to donate for medical reasons. Cardiovascular disease (ischaemic heart disease and cardiac failure) is the commonest reason for non-donation: nine cases (39%). Combined renal disorders account for a further seven cases (30%).

Two potential donors were found to have thyroid disease and were referred for treatment but failed to rejoin the work up process.

Discussion

Low donation rate

Live donor transplantation is the most viable mode of keeping pace with the increasing numbers being added to the transplant waiting list. Compared with cadaveric organs these transplants offer the best outcome in terms of graft survival and function irrespective of HLA matching [8]. In addition, by allowing pre-emptive transplantation, patient survival is further enhanced [9]. However, the high proportion of drop-outs during the work up process translates into significant cost and effort (especially as many come from abroad) for no reward. This study reports an 18% donation rate, other studies have shown 13–34% donation rate [10,11]. Generally, women donate more [12]. This study found more females came forward as potential donors but males predominating as actual donors—although this was not significant. One explanation is that many potential donors are males coming from abroad, where the women are left to care for the family at home—these men are already highly motivated to donate and often complete the process. Related donors were also more likely to donate than unrelated, probably due to a greater ‘emotional attachment’ as fewer withdrew from the work up process.

Blood group and cross-match incompatibility

Incompatibility accounted for 30% of all non-donations. Beekman et al. found that 35% of potential donors were excluded for immunological incompatibility most commonly due to a positive cross-match [11]. Similar findings have been observed by other studies [13] but the cause of frequent positive cross-matches between spouses remains unknown.

Currently, in the St George’s programme such incompatibilities mean exclusion from donation. Yet both ABO incompatibility [14] and positive lymphocyte cross-matching [15] has been overcome with good long-term results. However, a prolonged and rigorous immunosuppressive protocol must be adhered to. Addressing this problem from a different perspective, Park et al. report significant success with a ‘pooled live donor exchange’ programme for incompatible donors [16].
Donor withdrawal

Withdrawal due to donor uncertainty is common in this and other work [10,11]. The reasons for this are poorly defined in the published literature and this is an area that needs investigation. In this paper, work commitments, ‘change of mind’ during the work up process and fear of the surgical risks are the commonly cited reasons. Others were family planning or simply not wanting to give any reason. Assessment by a clinical psychologist/counsellor may better elucidate the donor’s reasons and help to resolve any underlying problems. We feel it is essential, however, that throughout the process the prospective donor feels under no duress and free to withdraw at any time.

Medical disorders

Medical disorders (mainly previously unrecognized disease) accounted for 39 (25%) of potential live donors failing the work up process—16 (10%) with inadequate (<80 ml/min/1.73 m²) GFR and 23 (15%) with medical contraindications, predominantly due to cardiovascular disease. Beekman et al. found 29% of potential donors unacceptable due to medical problems [11]. Currently ‘medical paternalism’ predominates over individual autonomy when the final decision as to the fitness of the potential donor is made. The contrary view has its supporters [17], but we believe that at present there is no adequate data to make a reliable assessment of the risks in the less than perfectly healthy individual.

Cadaveric donation

There were 13 cases in which patients received a cadaveric transplant whilst their potential live donor was undergoing the work up process. An argument can be made to suspend such patients from the cadaveric waiting list whilst the live donor assessment is in progress. However, with an actual live donation rate of only 18%, we take the view that it is unfair to deny the patient the opportunity to receive a cadaveric organ, as the odds of completing the live donor transplantation are poor.

Support for non-donors

Successful donors can expect good physical [18] and mental health [19] once recovered and high self esteem. However, there is no assistance other than advice given to those failing the work up process. At the very least this is likely to be anxiety provoking, but may also affect relationships and have implications for obtaining mortgages, health insurance, etc., in the future. Counselling has been suggested for those who are unable to donate for whatever reason, which we would support, but currently there are few data available in this area [20].

Potential solutions

A donor exchange programme would help address the common problem of immunological incompatibility. In a ‘paired exchange’ two willing but incompatible live donor–recipient pairs are brought together for a ‘swap’ (Figure 2).

In a ‘pooled exchange’ several incompatible donor–recipient pairs are collected together and a ‘chain’ is formed between the various pairs to complete the ‘swapping around’ of organs. Such a programme requires considerable logistical support to ensure that the appropriate matching criteria are satisfied, that all parties are willing to proceed, confidentiality is maintained and there is no reneging.

At present there are no exchange programmes in the UK. Pooled live donor exchange has been considered by a working party of ULTRA and the British Transplant Society in 2001 but rejected as practically and ethically untenable. Currently, paired live donation is being reviewed by the process of public consultation through ULTRA [21]. If widely applied such programmes could significantly increase the potential live donor pool.

Dedicated live donor co-ordinators enhance the numbers entering the work up process and subsequent yield, although a lag of 1–2 years should be expected before measurable improvement is seen (personal communication L. Burnapp, Nurse Consultant Live Donor Transplant Co-ordinator, SE Thames Region). In particular, targeting ethnic groups has been shown to be efficacious [22].

Psychological assessment of potential donors and evaluation of the reasons for non-donation will help target those most likely to complete the donation process, and also better identify the issues that lead to withdrawal from a programme. Currently, these factors are unknown and thus cannot be addressed. How far the potential donor should be ‘pushed’ is a complex issue. However, policing the fine line between positive encouragement and coercion is the responsibility of all the professionals involved in the donor’s care.
Conflict of interest statement. None declared.

References

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