Minutes of the Derby Medical Society Wednesday 10th January 2018
Derby Medical School Lecture

Apologies

Mr Steve Milner
Dr Sarah Milner
Dr John Eisenberg

Speaker

Professor Simon Kay
FRCS, FRCS(plas), FRCS Ed(Hon), BMBCh
Consultant Plastic surgeon Leeds Teaching Hospitals

Hand Transplantation

Not everyone who loses an arm or hand ends with a hand transplant.

The hand is special: it is distinct, communicates actively and passively, has a sexual function, symbolic and aesthetic function and language function.

Roberto Gilbert (Ecuador) attempted the first hand transplant in 1964. It failed.

Skin is not the problem in transplant rejection. This was a misunderstanding in early transplant research using skin grafts and observing subsequent rejection.

Professor Kay then went onto present the history of hand transplantation with some of the more relevant case histories.

First Modern Case of Hand Transplant (1998)

Patient lost his hand while in prison in 1984 and it was replanted.
Hand amputated in 1989
Received hand transplant in 1998 but did not comply with post-operative treatment so transplanted hand was amputated in 2001.
He had no pre-operative counselling prior to transplant
Psychological rejection is as important as immunological rejection.

Second Modern Hand Transplant (1999)

Performed in Louisville (USA)
There was careful development, planning and psychological assessment
The transplant is still a success 19 years later.

Further allotransplant developments

The hand is now the most common allotransplant (55% of worldwide cases in July 2014).
Other successful allotransplants are the face and larynx.
Lower limb transplants have been carried out but without success.
Lower limbs are successfully replaced with prostheses. Professor Kay commented that there almost never a valid clinical indication for a lower limb transplant due to the advances in lower limb prosthetics.

Success rates of Hand Transplants

Success rates vary between countries and units globally.

Overall the success rates of hand transplants now reaches 98% (excluding initial mortality and acute graft loss)
Prof Kay started planning hand transplants in 2000.
He trained in Lyon, France alongside a pioneer of hand transplantation Mr Aram Gazarian.

Transplant or Prostheses?

Prostheses can be incredibly complex but are costly (approx £250K) and have limited function.
Transplanted hands are silent, inexhaustible, intuitive, sensation, proprioception, feel warm, sweat, always "on", self repairing and human.
Prosthetic hands rely on muscle feedback and have only 2 channels.
The cascade of information from the brain has 60000 channels.
Rejection curves for prostheses are steep.

Professor Kay finally got agreement from NHSE and for the first two hand transplants in Leeds in 2010
The Ethics committee had some objections:

The effects on immunosuppression on healthy individuals
The natural history of handlessness

The Leeds team had to work with the UK Plastics andOrthopaedics regulatory bodies, ethics committees and build a consensus to move forward to plan the first hand transplant.

NHSE and the financial picture then changed after the first hand transplant.
After 3 years of going through funding committees a 5 year contract was awarded.

The key is that Leeds is the hub with spokes and shared learning for hand transplantation

Screening for suitable patients is essential and rigorous, involving numerous appointments and psychological assessments. Only 5% of potential recipients are assessed as being suitable for hand transplantation at the end of the assessment process.
Patients go through a year of clinical assessment appointments.
The immunological cross-match is sent to Bristol so that matched donors can be identified quickly.

First UK Hand Transplant

The first UK hand transplant in 2012 was performed as an amputation and transplantation on a man whose hand function had been severely impaired by untreated gout.

Immunomodulation therapy is similar to other transplant therapies, using Alemtuzemab and methylprednisolone induction, followed by tacrolimus, prednisolone and mycophenalate long term as triple therapy.

Acute rejection of the transplanted hand occurred 6 times in the first 6 months
Rejection can be recognised quickly due to onset of a skin rash.
After some investigation it was realised that rejection occurred due to the patient sunbathing

Transplantation is less successful than replantation as central neuronal death occurs early on.

There then followed the 3 year moratorium before further transplants were performed in Leeds.

Complications seen in other cases:

Mucormycosis infection
Muscle mass not sufficient at time of surgery

Unexpected Findings from initial hand transplantation procedures.

Complexity of screening and waiting list times

High numbers of staff and operating rooms required for double transplants
Risks to reputation of unit and sponsors
Post operative care and follow up plans when patients live away from Leeds
Media attention
Competition for referrals
Complexity of management of rejection
Psychological support for recipients
Matching difficulties
Complexity of decision making for all, particularly with regard to transplantation level.

The Leeds Clinic is now called Upper Limb Loss Clinic to reflect that transplantation is not the best option for many patients and it is an MDT approach.
The clinic started to receive input from a prosthetist and rehabilitation medicine in the past year.
Rehabilitation clinics are not referring patients for consideration of upper limb transplantation.

Upper limb transplant for Bilateral limb loss has better outcomes than prosthetics.

The future could include transplanting at higher levels, transplanting limbs in children, more single side hand transplantation.

In conclusion Professor Kay iterated that the team matters he is part of the Leeds team.

Questions

Sensory function after transplantation, including pain syndromes? There is recovery and this is good. Children, tacrolimus and short distance for nerve regrowth improve outcomes. Pain syndromes are not common after transplantation

Do transplanted hands heal normally? - Yes

Transplantation in children and hand growth? - Give a child an age matched hand and it will grow

Additional interest in Brachial Plexus Injuries

Risks of pre-existing disease (psoriasis and gout) affecting the transplanted hand - less risks and hand has different genotype

Vote of thanks given by Dr Holloway

Medical Society News

Dr Holloway was pleased to announce that Miss Susie Hewitt (Emergency Medicine Consultant at the Royal Derby Hospital) will be the President for the 2018-19 season.

Case Presentations for doctors in training will be held on Wednesday 21st February. Entry forms can be found on the DMS website

The Annual Dinner will be held on Saturday 10th March at the Hilton, St George’s Park. Tickets are £54 per person and are available from Tracey at Alexin.

Register	22	members
	5	guests
	23	students

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Dr Stuart Holloway, President 2017-18.