Are donors who die from hanging suitable lung donors?

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Four case studies that say… "yes"

- 28yF, ABO O, found hanging in basement s/p drug ingestion, apprx. 30 min DT
- Declared BD 3 days post-admission
- PMH: depression
- CXR: Atelectasis vs. early infiltrate Left lower lobe, final clear bilaterally
- Routine vent management
- Normal bronchoscopy
- PF: 365-338-398-293 (100%/5 PEEP)
- Bilateral lungs one recipient at NYCP (zone B, backed-up with MAPB)

- 17yM, ABO A, found hanging in garage, apprx. 35 min DT
- Declared BD 4 days post-admission
- PMH: depression
- CXR: clear throughout
- Routine vent management
- Normal bronchoscopy
- PF: 471-564 (100%/5 PEEP)
- Single lungs two recipients at MNUM & MNSM

(local centers)

- 27yM, ABO O, found hanging, on EMS arrival still had feet touching floor, apprx. 6 min DT
- Evaluated for DCD 3 days post-admission
- PMH: chewed tobacco, healthy athlete
- CXR: bilateral atelectasis & mild vascular congestion- cleared with increased TV & diuresis
- Routine vent management
- Normal bronchoscopy
- PF: 355-452 (100%/5 PEEP)
- 24 min WIT, followed by DCD procurement
- Single lung one recipient at OHCC; list exhausted for left lung

(Zone B)

- 9yF, ABO O, accidental hanging with scarf on bunk-bed, apprx. 30 min DT
- Declared BD 8 hours post-admission
- PMH: moved from refugee camp in Thailand 9 months prior; questionable history malaria, family denied
- CXR: clear throughout
- Routine vent management
- Normal bronchoscopy
- PF: 420s-450s (100%/5 PEEP)
- Bilateral lungs, one recipient at MOBH

(Zone A, no local recipients)

Donor Info…	*Recipient Info…*	*Recipient follow-up…*
28yF ABO O Declared 3 days after admit 30 min DT PMH; depression	NYCP (bilateral): 61yF LAS 67.5	(6 month) Living (9 month) "Everything went well on this transplant; there were no complications." (Dr. Sonnet)
17yM ABO A Declared 4 days after admit 35 min DT PMH: depression	MNSM (right): 56yM LAS 44 MNUM (left): 44yM LAS 39	Good early follow-up
27yM ABO O DCD Donor, started 3 days after admit PMH: chewed tobacco; healthy athlete	OHCC (right lung): 60yM, LAS 31	(1 month) Doing fantastic – out of the hospital, doesn't know if he is "home -home" but is coming in for follow-ups. Walking on treadmill 20 min a session, stops because legs are weak – not out of breath. Graft doing great.
9YF ABO O Declared 8 hours after admit 30 min DT PMH: recent refugee camp	MOBH (bilateral): 8yF, LAS 29	Good early follow-up

Case Study: Lilly

Presented by
Pacific Northwest Transplant Bank
Julie Bronleewe, RN, BSN, CPTC

Lilly

- 5-year-old girl
- Nephritic syndrome since age 18 months
- Received living donor kidney transplant on 11/ 20/2009 from family friend, Patricia

Lilly

- 5 hours post-op developed ↓Na
- Seizure activity ensued followed by Cerebral edema
- Brain death declared 11/21/2009

Challenges

- Transplant surgeon
- Family requesting directed donation
- Obtaining consent, med/soc history
- Obtaining blood for serologies and crossmatching from both

Challenges

- Procurement: two crossclamp & flush times
  - Kidney recovered first
  - Aorta clamped then liver recovered

Outcome

- Kidney recipient:
  - Blood and tissue match
  - Listed at same transplant center
- Liver recipient:
  - 7-year-old suffering from biliary atresia
- Both recipients doing well

Going The Extra Mile

One OPO's experience with an unusual donor case

Presented by
Frank Rathman
CPTC

Donor Alliance

Four Transplant Programs in Colorado

- **University of Colorado**
- **Centura Porter Adventist Hospital**
- **Presbyterian/St. Lukes Medical Center**
- **The Children's Hospital**

Square Miles = 200,000+

Population = 5 million

Acute Care Hospitals = 67

Critical Access Hospitals = 40

Donor Alliance Staff

- 1 Director of Organ Procurement
- 1 Clinical Supervisor
- 9 Full Time Organ Recovery Coordinators
  - 3 Levels of ORC
- 4 Full Time Organ Recovery Specialists
  - 2 Levels of ORS
- 1 Organ Administrative Assistant

Use this space to cite data, text sources

The Donor

- 17 y/o male
- The only medical history given was complaint of headache and flu-like symptoms for two days, then a sudden loss of conscious in the shower that prompted the call to 911
- Per neurosurgeon process causing herniation is unclear. Could be low grade tumor, less likely trauma of infection, but etiology is "all a guess at this point."

Use this space to cite data, text sources

Initial Findings

- Initial CT showed hydrocephalus secondary hypodensity in posterior fossa, swelling of left cerebellum
- MRI neuroradiologist reading: "unusual appearing mass within left cerebellum. Unusual linear striation. May represent Lhermitte-Duclos disease, alternatively low grade neoplasm could have similar appearance."

Use this space to cite data, text sources

Initial Interest Calls

- All initial interest calls yielded the same response: "Sorry but, without knowing what the mass is we are not interested."
- The parents and grandparents of this donor were very interested in him being a donor and asked us to do everything we could.

Use this space to cite data, text sources

What Next?

- After talking with the pathologist at the donor hospital I found that if we were able to provide him a sample of the mass he felt he could determine what the mass was with some degree of certainty.
- I approached the neurosurgeon that had been treating the donor prior to brain death and asked him if he would be willing to do a brain biopsy. At first he was not sure he was willing to do it, but after appealing to his emotional side and reminding him that he had felt bad that he was unable to tell the donor's parents what had caused their son's death he agreed to do the biopsy.

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What Next?

- We took the donor into the OR for the biopsy and were able to provide the pathologist with enough sample to do the testing.
- It was at this point that we were told that the staining process that would be needed to be performed on the slides would take 24 to 36 hours to complete.
- As we had already been on the case for almost 24 hours at this time, we made sure that the family approved of the new delay.

Use this space to cite data, text sources

Results

- Throughout the next day we were able to maintain the donor without complication.
- Once we got the results from the pathologist, it showed that the mass was in fact an abscess from an infection.
- With this information we were able to start placement.

Use this space to cite data, text sources

Organs Placed

- Bilateral Lungs
- Liver
- Both Kidneys
- Pancreas
- Heart For Valves

Use this space to cite data, text sources

Conclusions

- The Organ Recovery Staff of Donor Alliance worked on this case for 73 hours, went to the OR two times, and placed six organs for transplant.
- During initial interest calls at the start of the case, were told it would not be possible to place organs from this donor.

Use this space to cite data, text sources

Conclusions

By thinking outside of the box and going the extra mile an OPO can make life saving donations happen.

Use this space to cite data, text sources

The Utility of Test Donors

Adam D. Bell, AA, CCEMT-P, CPTC
LifeBanc

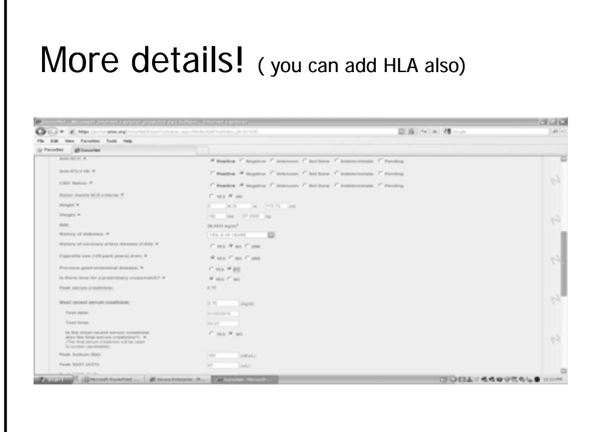
Multi-Purpose

- Teach new organ allocation staff
- Find out in, real time, if there are recipients who will appear on *your list* given the donor's size, peak labs, and serology status
- Examples allow an opportunity to consider different organ allocation tactics

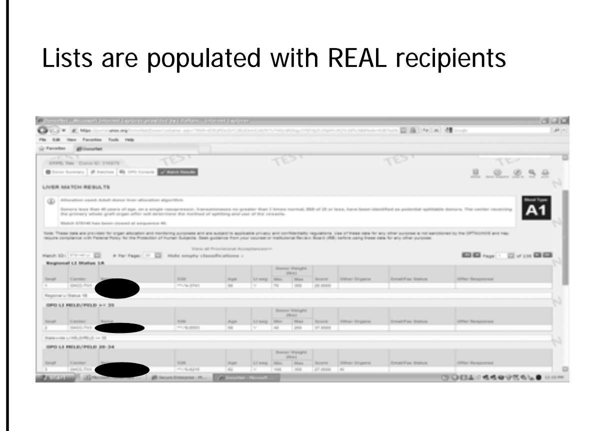
Where do I make a test donor?

Specifying your donor's info

More details! (you can add HLA also)



Lists are populated with REAL recipients



Teaching points… should we back up the double lung with a left only given the chest trauma on the right, and the CT findings which include multi pulm contusions?

+ Serologies… donor has NO potential HR recipients.

Size matters…Only 1 LU recipient Nat'l { with an LAS score of 0 }

New Tactics: The Intestine Question

- At my OPO in 2009; 3 intestines were transplanted from donors in our DSA
- Additionally from separate donors both a LI+ IN and PA + IN were turned down in OR

Are the odds of a yes for IN greater if you offer the Panc with the IN?

- Yes !
- As the previous slide shows 20% of the “provisional yeses” received came from IN + Panc combo offers
- Consider the following list… If you have an adult donor and status 1s on your LI list…

Test Donors

- A world of possibilities, with no UNOS violations…
- Questions ???????????
- Thank you for your time and attention!

Lung Recruitment in Action…

Tracy DeMars RN, CPTC
LifeSource
January 14, 2010

26 year old, female
62 inches - 101.3kg (***BMI 41)

- History of mental retardation and epilepsy since birth.
- On 2/4, developed fever of 103 and sore throat, she was seen at clinic and was treated with Amoxicillin.
- On 2/10, temp continued and CXR showed right mid lobe infiltrate, treated for pneumonia.
- On 2/14, she had a grand mal seizure at home, lasting ~10 minutes with respiratory distress, EMS transported to an outlying hospital.
- 2/14 CT of chest showed pneumonia to be cleared.
- 2/16 LOC declined; she was tachycardic and tachypnic, was intubated and transferred to St. Cloud Hospital. Neurologic status continued to decline and a CVA of unknown origin was found on CT.
- 2/17 was pronounced brain dead 1745.

Other challenges:
Mayo clinic MDs concerned about the unknown etiology of infectious process and CVA.

- CT chest obtained from outlying hospital from 2/14 which notes the pneumonia to be cleared.
- St. Cloud ID consult ordered:
  Concluded -"it was primarily a upper/lower respiratory infect and not CNS infection that had been treated adequately with antibiotics."

Bronchoscopy:

- No pulmonary edema, airways normal, no peritracheal/ peribronchial ecchymosis, no evidence of GI aspiration, no evidence of foreign body aspiration. Mucus plugs cleared.

- 2/18 0530

- Chest x rays:

Small amount atelectasis in the bases left > right. Lung volumes low.

- O2 challenge:

pO2 **182**

- Vent settings:

CMV 10, TV 650, peep5

Treatment:

- Peep to 10 x 2 hours

2/18 0950

Response to treatment:

O2 Challenge after peep recruitment-pO2 **286**

- 2/18 0900
- Discussion among onsite DC, CRC, and APDC regarding whether this donor was a candidate for lung donation, based on recent history of pneumonia
- Consult with Dr. Whelan, Transplant Pulmonologist at MNUM
- It was determined that with the current clear CXR, clear bronch, and CT that showed resolved pneumonia, this 26yo non-smoker should be considered IF oxygenation improved
- During the day, we also discussed the possibility that the PF ratios may be lower than actual values, due to the large BMI. Data showed lower PF ratios correlate with higher BMI. This had been discussed at previous Lung Summits.

2/18 1130
Lung Evaluation
ABG:PH 7.51, pCo2 30, pO2 **79** HCO3 24

Treatment:
- Increase TV to 700
- Decrease rate
- Increase # of puffs of inhaler to six to ensure they are "reaching the patient".
- Chest X ray ordered

2/28 1200
Evaluate lungs:
- ABG- PH 7.48, pCo2 32, pO2 **98**, HCO3 24
- Chest x Ray – Small amount atelectasis

Treatment:
- Increase TV 730
- Increase inspiratory time to keep pip <35
- Decrease rate to 10
- Order bag and open suction every 2 hours

Response to treatment:
- O2 Challenge-**352**
- Pip >35 with inspiratory time increased - consult with RT and decreased TV to 720 to maintain pip 27-29.

- Fluid volume = -2000cc during donor management
- CVP decreasing with diuresis
  - Initial CVP 11
  - Final CVP 7

2/18 0100 Chest film with low volumes

- 2/18 1325 Note the sharp angles and full ventilation of the lungs with increased TV

- 2/18 1700
Lung evaluation:
ABG – ph 7.49, pCo2 35, pO2 120, HCO3 26
Pip -27

2/18 1830
- O2 Challenge: **387**

- Direct conversations with both local lung transplant programs during the day
- Both centers with interest
- Bilateral lungs placed MNSM, back-up MNUM

Follow-up to speculation regarding high BMI:

- APDC requested onsite DC to assess pulmonary vein gases in OR, once chest wall opened

- Final O2 challenge just prior to OR: **395**
- Pulmonary Vein Gases:
  - Right Lung – **595**
  - Left Lung - **526**

Applications:
- Assessment of current and thorough picture of lung function and oxygenation is crucial
- A DETAILED history of events clarified concerns of contraindications for lung transplant
- ID Consult gave additional information that pointed to low likelihood of infectious process
- Application of standard lung management protocols proved successful
- Patients with higher BMI and good lung function may have lower actual PF ratios
  - Weight of chest wall causes additional pressure on chest, especially in supine position & unable to position self
  - Can potentiate increased atelectasis
  - In comatose patients without spontaneous respiration, sighs, etc,… this effect may be even more pronounced

Case Scenario

Judith M. Knuth, RN, BSN, CPTC
Senior Organ Recovery Coordinator

NATCO Symposium for Advanced Transplant Professionals

DONATE LIFE New Mexico

Initial Referral

- Pt found by a colleague (police partner) pulseless, with a large amount of emesis noted, bystander CPR started. EMS documented an initial rhythm of asystole, epi and atropine given and pt converted to v-fib, cardioverted x2 to sinus tachycardia. Pt had a total of x2 narcan, x4 epi, x3 atropine, x3 lidocaine, x1 HCO3. Downtime estimate of x5 min. Pt intubated then transported and stabilized in ED, admitted to ICU with a diagnosis of suspected suicide with tox screen indicating polysubstance drug overdose.
- History of: Depression, chronic pain, opiate and benzodiazepine dependency, bowel obstruction x8 years ago, kidney stones 5-6 years ago, HTN diagnosed 1.5 years ago (no meds prescribed, improved with diet & exercise) chewed tobacco and smoked cigarettes on/off for 15 years, when smoking averaged 0.5 ppd

Referral Time Line

- 10/23/09: On admit to ICU mucomyst started, no vasoactive medications, BSR's present, referral to NMDS made, initial onsite done by organ recovery staff and plan to follow up q shift
- 10/24/09: No changes in status
- 10/25/09: early a.m. bedside RN called to update NMDS coordinator the pt became hypertensive and nipride gtt was started, apnea test done with respirations observed, no other BSR were observed on clinical exam, plan to re eval in a.m.
- 10/25/09: NMDS coordinator rounds on day shift, donation discussion with NMDS family care coordinator, MD's and wife, pre brain death paperwork completed and NAT, serology and HLA typing blood drawn and held for testing, plan to observe pt for potential brain dead organ donor
- 10/26/09: early a.m. bedside RN called to update NMDS pt became hypotensive and vasopressor support was initiated, neuro exam done by MD and respirations remained.
- 10/26/09: NMDS coordinator rounds on day shift, day shift MD's, family care and wife discussed DCD, consent signed for DCD and plan for afternoon O.R. time, blood sent for NAT testing, serology testing and HLA typing, hospital staff in ICU and OR made aware of family's wishes and Hospital Development Coordinator, NMDS recovery coordinator and NMDS Family Care Coordinator remained onsite to assist in patient management, family care and hospital DCD procedure

Case Progression

- MD continued to manage the pt, cultures, solumedrol, ABO's, labs and heparin for OR requested by NMDS. NMDS coordinator reviewed the labs and discussed the POC with the RN at the bedside and the MD. Pt had an increased UOP consistent with DI, and the 3% NS bolus q6 had not been dc'd.
- POC included K replacement and to d/c the q6 3% NS bolus. Allocation for kidneys and liver was initiated remotely. NAT testing results were delayed and the OR had a full day schedule, family was informed and OR was rescheduled for 1800. Kidneys were allocated locally, and with the additional time delay the liver was successfully placed in the region with CAUC. NMDS Family Care Coordinator presented to opportunity of liver recovery in addition to kidney recovery to the family. NMDS does not have any extra renal programs in their DSA. For the accepting liver center to send a procurement team an additional four hours was requested. OR time of 0000 was presented to the family, they agreed. OR, CAUC recovery team and NMDS recovery team and were made aware of the rescheduled OR time. Terminal labs were drawn.

Labwork

	Initial	Terminal
Na	184	190
K	3.1	2.3
Cl	125	140
CO2	21	19
Bun/Cr	11/1.4	12/1.3
Tbili	2.1	2.5
Ast/Alt	46/40	40/41

Case Outcome

- Pt was moved to the pre op holding area, NMDS Organ Recovery Coordinator, Family Care Coordinator were at the bedside in addition to CAUC recovery team in MD lounge, the Hospital OR staff on standby, and NMDS Hospital Development Coordinator on site.
- Extubated 10/27/09 0047, expired 10/27/09 0100, CC 10/27/09 0120, flush 10/27/09 0120
- Liver and bilateral kidneys recovered. Kidneys were biopsied and pumped per local NMDS protocol. Both kidneys were transplanted, 63 yo and 65 yo local recipients. Liver was transplanted into a 59 yo at CAUC.

Challenges

- Orchestrating a donor at cardiac death with one organ recovery coordinator. NMDS was managing two cases simultaneously.
- Working with the hospital staff to assist with a DCD. In a DCD case we do not initiate orders, we assist the hospital staff with orders.
- Delayed NAT testing. NMDS sends NAT testing out of state for processing.
- Full O.R. schedule. The hospital this case took place at is the largest private facility and the case occurred on a Monday with a full day O.R. schedule.
- Requesting additional time from the family. The family wanted the case to occur in a timely manner.
- No extra renal programs in the NMDS DSA. NMDS has two local kidney transplant centers. All other organs must be allocated and transplanted out of state.

Interventions

- The family care coordinator and the hospital development coordinator remained onsite. They were able to upload documents to UNET, assist with data entry, etc in addition to caring for the family and updating the hospital staff of case progression. Allocation was handled off site by the Director of Clinical Services and Hospital Relations. Delegate tasks to others willing to assist.
- Full review of the chart should have been conducted, not just a verbal report from the MD and RN at case start. The 3% saline order should have been requested to be dc'd and I/O's should have been monitored closer by the NMDS coordinator. Try not to lose sight of the donor's status and maintain close communication with the bedside RN and the MD responsible for the orders.
- NAT testing is protocol at NMDS on all donors. Administrations at the lab and within NMDS have had multiple conversations regarding the cause of delayed results. This includes delays in transportation, stat runs being run on a batch run schedule and difficulty in reporting results. Pay attention to important time points within the process and if each time point is not achieved as planned trouble shoot and document for follow up.

Interventions continued

- Full O.R. schedules are common at this hospital. The Hospital development staff worked with the OR staff to adjust the OR time accordingly and the family care coordinator always made the family aware of the delays and shared the rational.
- When donation was initially mentioned to the family the NOK was very receptive. She was very supportive and involved the pt's family in developing an acceptable time frame for the case to occur. With the OR schedule and the delay in NAT results the time had already been delayed. With the additional delay NMDS successfully allocated the liver. An additional time request was made to the NOK to request time for the logistics of liver recovery. It was explained with the extra time another organ would be recovered for transplant. The Family Care Coordinator was hesitant to present a second delay request, but with the rational explained the entire family supported this decision.
- NMDS does not have a local liver program. With DCD cases it is very difficult to allocate the liver. Incoming teams are hesitant to send procurement staff the distance due to the uncertainty of the outcome of the case. Very few regional centers have shown interest in traveling to New Mexico for a DCD liver recovery. A previous case was attempted with UTLD, however the liver recovered by UTLD was biopsied and the results indicated the liver was not transplantable. In this second DCD attempt CAUC agreed to the liver recovery in the case, making it the first successful liver recovery from a DCD donor in New Mexico.