Tumours in the donor: what is the risk?

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Financial Disclosure

• Research & Travel grants from Astellas, Novartis, Roche, Sandoz
Conflicts of Interest
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Eurotransplant annual report 2012
Tumours in the donor: what is the risk?

- Cancer can be transmitted by organ transplantation
Tumours in the donor: what is the risk?

• Cancer can be transmitted by organ transplantation

• Cancer can be transmitted otherwise
  - mother-to-fetus
  - fetus to fetus (twins)
  - daughter to mother
  - patient to surgeon
Tumours in the donor: what is the risk?

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Calcineurin inhibitors

Guba et al.  Transplantation 2004
Calcineurin inhibitors

Guba et al.  Transplantation 2004
Calcineurin inhibitors

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Calcineurin inhibitors

Guba et al. Transplantation 2004
Cyclosporine induces cancer progression by a cell-autonomous mechanism


<table>
<thead>
<tr>
<th>Cell Type</th>
<th>Control</th>
<th>CsA 40 mg/kg</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>Kidney adenocarcinoma (Renca)</td>
<td>241±22</td>
<td>338±26</td>
<td>0.007</td>
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<td></td>
<td>350±22</td>
<td>441±20</td>
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<td>Pulmonary carcinoma (LLC)</td>
<td>11±2</td>
<td>28±4</td>
<td>0.003</td>
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<td>Bladder carcinoma (T24)</td>
<td>63±18</td>
<td>138±21</td>
<td>0.01</td>
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**Figure:**
- **Control** and **CsA 20 mg/kg 1d/2** show differences in tumor growth.

**NUDE MICE,**
- IV injection of tumoral cells
- Sacrifice D19-23
Cyclosporine induces cancer progression by a cell-autonomous mechanism


NUDE MICE,
IV injection of tumoral cells
Sacrifice D19-23

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Pulmonary carcinoma (LLC)
11±2
28±4

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CsA 20 mg/kg 1d/2

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338±26
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P
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0,003

CsA + AntiTGFβ
284±34
0,01
Cyclosporine induces cancer progression by a cell-autonomous mechanism


NUDE MICE,
IV injection of tumoral cells
Sacrifice D19-23

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CsA + AntiTGFβ 284±34
Liver and metastases

Liver and metastases

Liver and metastases

Liver and metastases

Organ donation & donor cancer

• Patients diagnosed with neoplasia should not be considered for organ donation, except:

- low grade skin tumours
- in situ carcinoma of the uterine cervix
- primary CNS tumours (except high grade)
- low-malignancy grade kidney tumours

## Waiting lists

![Graph showing waiting list trends](image)

<table>
<thead>
<tr>
<th>Year</th>
<th>Liver waiting list</th>
<th>Deceased donor transplants</th>
<th>Living donor transplants*</th>
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<tbody>
<tr>
<td>1991</td>
<td>229</td>
<td>710</td>
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</tr>
<tr>
<td>1992</td>
<td>253</td>
<td>765</td>
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<tr>
<td>1993</td>
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<td>14</td>
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<tr>
<td>1994</td>
<td>212</td>
<td>892</td>
<td>24</td>
</tr>
<tr>
<td>1995</td>
<td>263</td>
<td>944</td>
<td>25</td>
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<tr>
<td>1996</td>
<td>327</td>
<td>1032</td>
<td>22</td>
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<tr>
<td>1997</td>
<td>374</td>
<td>1097</td>
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<tr>
<td>1998</td>
<td>492</td>
<td>1071</td>
<td>38</td>
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<tr>
<td>1999</td>
<td>593</td>
<td>1132</td>
<td>64</td>
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<tr>
<td>2000</td>
<td>803</td>
<td>1186</td>
<td>116</td>
</tr>
<tr>
<td>2001</td>
<td>1093</td>
<td>1714</td>
<td>124</td>
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<td>2002</td>
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<td>132</td>
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<td>2003</td>
<td>1384</td>
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<td>2004</td>
<td>1625</td>
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<tr>
<td>2005</td>
<td>1606</td>
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<td>2008</td>
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<td>2011</td>
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<td>2406</td>
<td>138</td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td>135</td>
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*Note: Living donor transplants data for some years is not available.

Eurotransplant annual report 2012
Tumours in the donor: what is the risk with LTx?
Liver Transplantation & Cancer Transmission

• Case reports
Liver Transplantation & Cancer Transmission

- Case reports
- Registries
  - Prospective: UNOS, UK, Australia, Italy, Spain
  - Voluntary: IPPTR
4 clinical scenarios

• Cadaveric donor with past history of non CNS cancer
• Cadaveric donor with past history of CNS cancer
• Cadaveric donor diagnosed with cancer shortly after liver transplantation
• Cadaveric recipient diagnosed with a cancer from donor origin months after liver transplantation
4 clinical scenarios

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Cadaveric donor with past history of non CNS cancer

• According to several published guidelines & Council of Europe: no organ donation
Cadaveric donor with past history of non CNS cancer

• According to several published guidelines & Council of Europe: no organ donation

• In all reported cases of non-CNS cancer transmission with organ transplantation in these last 20 years, none were known before donation!
UNOS 1994-1996

- 14,705 deceased donors
- 257 deceased donors with history of cancer
  - 650 organs (178 livers)
- Mean follow-up: 45 months
**UNOS 1994-1996**

### Table 1. Organs from donors with cancer history

<table>
<thead>
<tr>
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Italicized sites = histologically defined malignancies.
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Kauffman et al.  Transplantation 2000
UNOS 1994-1996

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Kauffman et al. Transplantation 2000
UNOS 1994-1996

No transmission of cancer in the recipients!
ATS 2013 Abstract #D1711

UNOS 1987-2009

204,946 organ transplantations
1,360 donors with history of cancer
  - 899 living donors
  - 561 deceased donors (55%CNS)
No increased risk of cancer in the recipients
2 cases of transmitted cancer from living donation KTx (myeloma & melanoma)
ATS 2013  Abstract#350

• NHS 1990-2008

17,639 organ donors
202 donors with history of cancer
High risk cancers in 61 donors (133 recipients)
  breast: 10, melanoma: 3, lymphoma: 5;
  colon: 3; ovary: 2; sarcoma: 4; CNS: 34
• NHS 1990-2008

17,639 organ donors
202 donors with history of cancer
High risk cancers in 61 donors (133 recipients)
  breast: 10, melanoma: 3, lymphoma: 5;
  colon: 3; ovary: 2; sarcoma: 4; CNS: 34

No transmission of cancer to the recipients
ATS 2013  Abstract #C1250

U Essen 2002-2012

47 LTx from donor with history of cancer
  - genito-urinary carcinoma: 19
  - CNS: 14
  - breast: 5
  - skin, thyroid, lung: 2
  - leukemia, larynx, liver: 1

No transmission of cancer by LTx
4 clinical scenarios

- Cadaveric donor with past history of non CNS cancer
- Cadaveric donor with past history of CNS cancer
- Cadaveric donor diagnosed with cancer shortly after liver transplantation
- Cadaveric recipient diagnosed with a cancer from donor origin months after liver transplantation
Cadaveric donor with past history of CNS cancer

• According to several published guidelines & Council of Europe:
  - low grade tumour: OK for donation
  - high grade tumour: no donation

- Higher risk if surgery, radiotherapy, VP shunt
UNOS 1992-1999

- 42,340 deceased donors
- 397 deceased donors with history of CNS cancer
- 1,220 organs (293 livers)
- Mean follow-up: 36 months

Kauffman et al. Transplantation 2002
UNOS 1992-1999

- 42,340 deceased donors
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No transmission of cancer in the recipients!

Kauffman et al. Transplantation 2002
UNOS 1992-1999

- 42,340 deceased donors
- 397 deceased donors with history of CNS cancer – only 19 with High grade Tumours
- 56 organs (15 livers)
- Mean follow-up: 36 months

Kauffman et al.  Transplantation 2002
Other series

- Australia & NZ:
  - 46 donors, 28 High grade, 153 organs, 27 livers
- Czech Republic:
  - 41 donors, 91 recipients
- UK:
  - 177 donors, 495 organs, 72 livers

No transmission of cancer in the recipients!
4 clinical scenarios

• Cadaveric donor with past history of non CNS cancer
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Cadaveric donor diagnosed with cancer shortly after LT

• Wait & See?

• Urgent retransplantation?
4 clinical scenarios

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Cadaveric recipient diagnosed with a cancer from donor origin months after LT

- Is there something to do?
- Reduction/interruption of immunosuppression
- Modification of IS from calcineurin inhibitors to mTOR inhibitors
- Appropriate therapy: surgery, chemotherapy
- Retransplantation (urgent or delayed)
Tumours in the donor: what is the risk?

Pr Olivier Detry

Dpt of Abdominal Surgery & Transplantation
CHU Liège, University of Liege, Belgium
What is the risk?

• Unknown
• Overestimated by publications of case reports
• Donors with active non-CNS cancer: no
• Donors with active CNS cancer: yes
• Donors with past cancer?
  interval, tumor aggressiveness
  lymphoma, melanoma: no
• Donors with no history of cancer ???
ATS 2013  Abstract#D1708

• NHS 2001-2010

30,765 organ transplants from 14,986 donors
15 donor-transmitted cancer
6 renal K, 5 lungs, 2 lymphoma, 1 NET, 1 colon

None of the donors were known to have cancer
Donor age

Eurotransplant annual report 2012
Donor age

Eurotransplant annual report 2012
Donor age

Eurotransplant annual report 2012
Graphique représentant l'incidence du cancer en fonction de l'âge pour les sexes masculins et féminins.
Litterature

• Breast cancer:
  - no reported case of transmission with liver transplantation!

• Prostate cancer
  - no reported case of transmission with liver transplantation!
Thank you!