Question:
Is the decrease in triglyceride content of the pancreas specifically related to type 2 diabetes and its reversal? Or is it merely a generalised effect of loss of fat from the body?

Design:
Compare pancreas triglyceride in matched groups of people with and without type 2 diabetes undergoing identical weight loss.
### Baseline subject characteristics

<table>
<thead>
<tr>
<th></th>
<th>Type 2 DM (n=18)</th>
<th>NGT (N=9)</th>
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</thead>
<tbody>
<tr>
<td><strong>Age (yr)</strong></td>
<td>49.1 ± 1.6</td>
<td>46.3 ± 2.1</td>
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<tr>
<td><strong>Weight (kg)</strong></td>
<td>121.0 ± 3.0</td>
<td>114 ± 5.0</td>
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<tr>
<td><strong>BMI (kg/m²)</strong></td>
<td>42.7 ± 0.7</td>
<td>41.3 ± 1.0</td>
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<td><strong>DM duration (yr)</strong></td>
<td>6.9 ± 0.5</td>
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<tr>
<td><strong>HbA1c (%)</strong></td>
<td>7.6 ± 0.4</td>
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<tr>
<td><strong>Insulin treated</strong></td>
<td>3</td>
<td></td>
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<tr>
<td><strong>SU treated</strong></td>
<td>9</td>
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</tr>
</tbody>
</table>

Fat mass in type 2 diabetic and normal glucose tolerance groups – before and after weight loss

Decrease body weight

T2DM: 13.6 ± 0.7%
NGT: 12.8 ± 0.8%
Fasting plasma glucose in T2DM and NGT – Before and after weight loss

Hepatic insulin resistance in T2DM and NGT – before and after weight loss

Liver fat in T2DM and NGT – before and after weight loss

Insulin secretion before and after weight loss

T2DM

Baseline

8 weeks

NGT

Baseline

8 weeks
First phase insulin secretion in T2DM and NGT – before and after weight loss

Pancreatic triglyceride in T2DM and NGT – before and after weight loss

Pancreatic triglyceride (%)

\[ p < 0.01 \]
\[ p < 0.005 \]

Pancreatic triglyceride in T2DM before and after weight loss

- Decrease of 1.2%
- Mean pancreas volume ~50ml

This represents ~0.6 grams of fat

Conclusions

Weight loss over 8 weeks brings about loss of pancreatic triglyceride specifically in type 2 diabetes.

It is likely that type 2 diabetes is caused by less than 1 gram of fat in the pancreas.