*S6: In-vitro pilot trial*

An in vitro pilot experiment was performed on a balloon filled with water and doped with Gadolinium Contrast Medium. This was conducted to determine the accuracy of volume measurements with the applied spatial resolution. The data were analyzed in the opensource software platform, Horos (<https://horosproject.org/>).

MRI of the balloon was initially performed with the same settings as that of the TrueFISP-images of the fetuses used in this study.

Then, a series of TrueFISP-scans with decreasing slice thickness (from 10mm-3mm) was performed on the balloon. TrueFISP scans with decreasing pixel size were introduced in 3 scans with 3mm slice thickness.

Volumetry of the balloon was defined by drawing lines around the edge of every slice of the balloon in Horos. Volumes were calculated the same way as described in the article.

True volume of the balloon was assessed by using a 3D high resolution isotropic scan. This was done with a 3D T1-weighted gradient echo sequence with the following parameters: Slice thickness 1.0 mm, FOV 240 x 240 mm, matrix size 220 x 220, giving a pixel resolution of 1.1 x 1.1 x 1.0 mm3. The scan duration was around 5 minutes, and the same analysis in Horos, as described above, was applied.

*In-vitro pilot trial results*

S6 shows the calculated volumes and MRI parameters for the in vitro study. According to the 3D high resolution isotropic scan (trial #12, S6), the true volume of the balloon was 123.3cm3. The difference between the true volume of the balloon, and the volume measured on the TrueFISP series with the same resolution as for the TrueFISP images of the fetuses, was 3.1 cm3 or 4.1 cm3 (difference 2.5% - 3.3% less than true volume, Trial # 1-2, S6).

Throughout the TrueFISP series with decreasing slice thickness (Trial # 1-9, S6), the volume of the balloon was between 2.8 and 13.9cm3 (avg. 5.6cm3 or 4.5%) smaller than the true volume.

Volumes measured on TrueFISP-settings with decreasing pixel size (Trial # 9-11, S6) were between 1.5 and 5.4cm3 (avg. 3.7cm3 or 2.98%) smaller than the true volume.

|  |  |  |  |
| --- | --- | --- | --- |
| **MRI Settings and Accuracy** |  |  |  |
| **Slice thickness** | **Pixel size** | **Volume (cm3)** | **Difference (cm3)** | **%-deviation** |  |
| 10mm | 1.51 | 120.3 | -3.1 | -2.5 |  |
| 10mm | 1.51 | 119.3 | -4.1 | -3.3 |  |
| 9mm | 1.51 | 109.5 | -13.9 | -11.3 |  |
| 8mm | 1.51 | 118.8 | -4.6 | -3.7 |  |
| 7mm | 1.51 | 115.4 | -7.9 | -6.4 |  |
| 6mm | 1.51 | 118.5 | -4.8 | -3.9 |  |
| 5mm | 1.51 | 120.6 | -2.8 | -2.2 |  |
| 4mm | 1.51 | 119.9 | -3.5 | -2.8 |  |
| 3mm | 1.51 | 117.9 | -5.4 | -4.4 |  |
| 3mm | 1 | 119.3 | -4.1 | -3.3 |  |
| 3mm | 0.7 | 121.8 | -1.5 | -1.2 |  |
| 1mm | 1.0 | 123.3 | 0 | 0.00 |  |

*S6: TrueFISP series of the in vitro experiment. 3D\_HR\_ISO (trial #12) indicates 3D high resolution isotropic scan.*