Conclusions: The source path for ring applicators is dependent on the geometry of the ring. The geometry of the ring causes the source cable to travel along a characteristic path that is different compared to the path of the source and has the effect of introducing significant deviation of the source from its expected position in the lumen and its direction of motion. The observation of significant differences between sets of 0.26 mm ring applicators has shown that, in some cases, multiple sets of the same applicator size can not be characterized by a single source path. Consequently, care must be taken to ensure that the source path of each ring is measured first.

**EP-1209**

Replacing cheese phantom with octavius phantom for delivery quality assurance (DQA) in Helical Tomotherapy (HT)

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**Purpose/Objective:**

To study the practicalities of using a high density dose volume phantom (Octavius phantom) for delivery quality assurance of helical tomotherapy (HT).

**Materials and Methods:**

In order to perform quality assurance on HT couch, 10 patients were selected for delivery of 3D-CRT plans. A1SL ionisation chamber with TPS calculated fluence was used for dose measurement. A1SL chamber was replaced by Octavius phantom and recalculation of TPS was done for QA purposes prior to HT treatment, practicalities could necessitate the use of OP as a backup measure. This study investigates the validation of OP octagonal QA tool (vol 0.125cc) in contrast to the circular CP (0.057cc).

**Results:**

The standard deviation of the measured doses of A1SL Chamber with cheese Phantom with the TPS calculated dose was 1.24 versus semiflex Chamber with Octavius Phantom was 0.979. For Fluence maps comparison using Octavius phantom, significant adjustments were made to the beam profile measured by 729 2-d array; but after shifting the coordinates a match was achieved to the TPS calculated fluence.

Conclusions: The Deviation of the Point Dose measurements of DQA inTomotherapy with A1SL chamber Cheese Phantom and semiflex chamber (Octavius Phantom) was within the accepted 1.24 and 0.979 were within tolerance limit (3%). Hence the point dose measurement of DQA plan in tomotherapy can be done with the semiflex ion chamber along with the octavius phantom. 2d array was also possible using a manual adjustment to the fluence coordinates using Octavius phantom. Octavius phantom could therefore be used for DQA of HT plans.

**EP-1210**

Dosimetric comparison of lateralised IMRT vs. 3D-CRT for unilateral carcinomas in the head and neck region.

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**Purpose/Objective:**

To compare the dose distributions of IMRT and 3D-CRT for patients with unilateral head and neck primaries. In September 2012, the Elekta Agility MLC was clinically introduced in one of the authors’ clinics. The Agility has 160 leaves of 5mm width over the full 40x40 cm field, with a very low transmission of < 0.5%. Leaves can interdigitate and move at high speed. Initially, we had only a single Agility linac and five MLCi2 linacs (with 10 mm leaves), so we aimed at maintaining exchangeability of patients between machines, without having to replan or reoptimize. In this presentation, we would like to highlight some pitfalls and practical issues encountered before and during clinical implementation.

**Materials and Methods:**

The Agility is modelled in the Pinnacle3 Treatment planning system (version 9.0). Even though the Agility has no backup jaws, in Pinnacle the jaws are present (even though they do not influence the dose computation). This can cause confusion, especially since the non-existent jaws can block the rendering of the actual leaf settings of the Agility. For each treatment that needed exchangeability, we first created a plan for the MLCi2. Using a Pinnacle script in combination with UNIX level programming, the beams of the plan were duplicated and converted to the Agility, creating a sum plan of both ‘plans’. In this step, single MLCi2 leaves were replaced by two Agility leaves. Furthermore, since the Agility does not have backup jaws, the position of the diaphragm jaws were automatically adjusted to shield the flagpoles that were no longer blocked by the backup jaws of the MLCi2.

**Results:**

After the conversion, we observed dose differences between original MLCi2 plan and the automatically converted Agility plan of up to 3 per cent for complex IMRT plans, which made adjustment of the number of monitor units for the Agility plans necessary. For some 3D-CRT plans, we encountered problems in the conversion when backup jaws for the MLCi2 were manually positioned beyond the leaves.

Conclusions: In clinical practice we found that it was difficult to find an algorithm to automatically convert from MLCi2 to Agility with 100% accuracy. Therefore, automatic conversion should be seen as an ‘aid’. One must take extreme care and dose distributions of MLCi2 and Agility plans must be compared rigorously, both using the DVT and the 3D dose distribution. As Agility was available in our institute, we stopped the conversion and prepared just one plan for each treatment, depending on the linac on which the treatment was performed.