Planning challenges of integrating the Advanced Gynaecological Applicator (AGA) into existing workflow alongside Utrecht Fletcher Tandem and Ovoid (T&O) interstitial applicator

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Background

Current IGBT workflow

- UF T&O capacity to insert needles parallel to tandem.
- Freehand needles used for lateral spread
- Iterative workflow used in physics team
- Post insertion needle positions evaluated
- Optimal needle positions and depth of insertion proposed for subsequent insertion

Introduction of AGA

- AGA was introduced allowing capability of oblique applicator needles plus needles through a perineal template

Proposed work flow

- Use T&O for first insertion
- Iterative workflow to include whether to use the AGA and propose needle positions and insertion depths

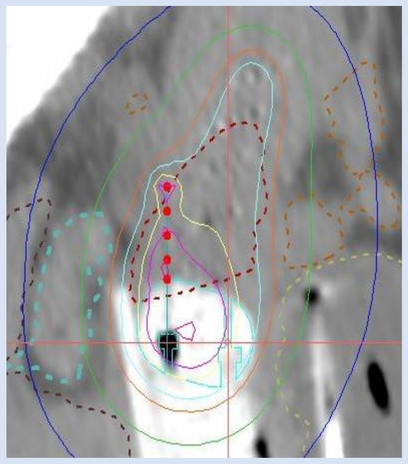
Applicator Comparison

Applicator	T&O	AGA
Tandem	Curved	Straight
	Choice of Angle	One Angle
	Variable Length	Fixed length
	Independent rotation	Fixed Rotation
Ovoids	Traditional	Ring Style

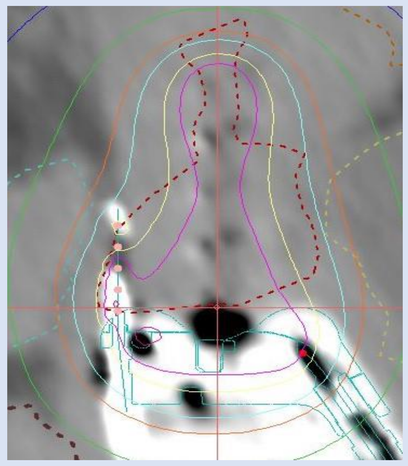
Positioning virtual AGA on T&O scan Challenge 1-rotation

- Tandem in T&O can be rotated independently of ovoids away from midline in response to CTV location
- Fixed geometry AGA cannot replicate this without losing some perineal template functionality
- Necessary to position virtual AGA midline not on visible tandem
- Subjective positioning difference of 10 ° between operators
- Rotation difference seen between proposed plan and actual insertion
- 2 additional needle positions proposed in critical regions
- Dwell positions could not be loaded in 2 needles

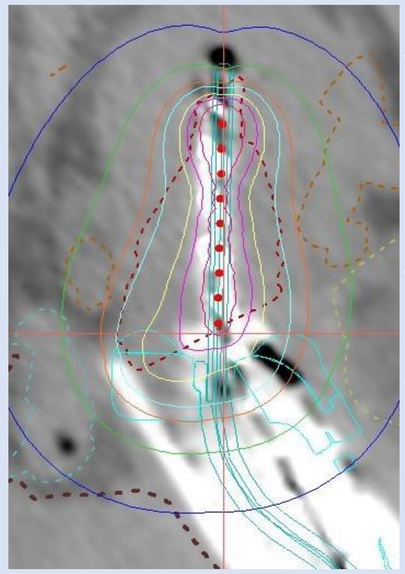
Virtual AGA rotation
Dwell positions loaded



Actual AGA Insertion
Dwell positions not loaded



Positioning virtual AGA on T&O scan Challenge 2-IU Angle



- 10-15°difference matching tandem position or ovoid surface
- Subjective between operators
- Significant differences > 5mm in virtual dwell positions particularly at depth

Conclusion

- Positioning a virtual AGA applicator on a T&O scan has significant uncertainties
- To compensate for uncertainty and ensure planning aims are met, more needle positions must be proposed but not all may not be used in the final plan
- It is recommended patients who will benefit from AGA applicator are identified at brachy MDT and it is used for all insertions

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