

XXXIII CONGRESSO NAZIONALE AIRO

# AIRO2023

BOLOGNA,  
27-29 OTTOBRE 2023

PALAZZO DEI CONGRESSI

Radioterapia Oncologica: l'evoluzione al servizio dei pazienti



Associazione Italiana  
Radioterapia e Oncologia clinica



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## **BRACHITERAPIA INTERSTIZIALE DEL CARCINOMA CERVICALE LOCALMENTE AVANZATO: SICUREZZA E ACCURATEZZA DELLA TECNICA IBRIDA NELLA PRATICA CLINICA MONOISTITUZIONALE**

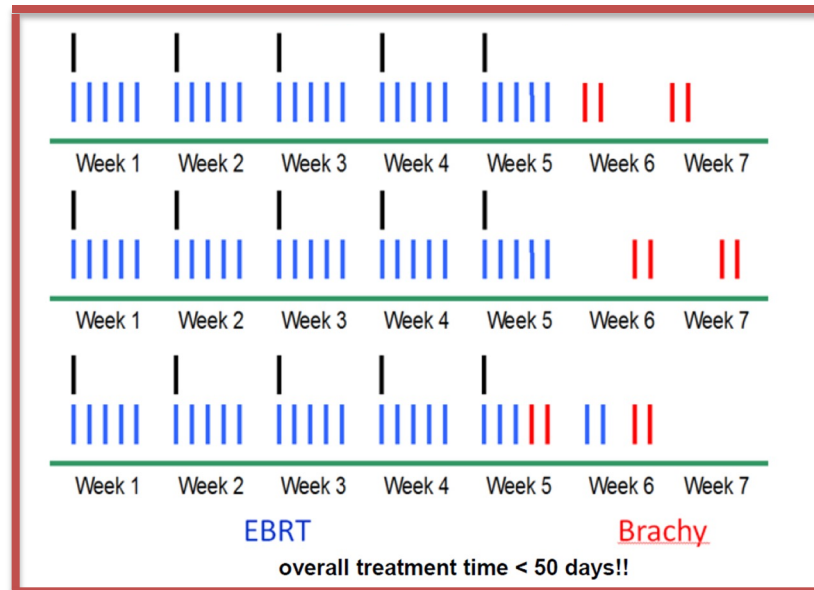
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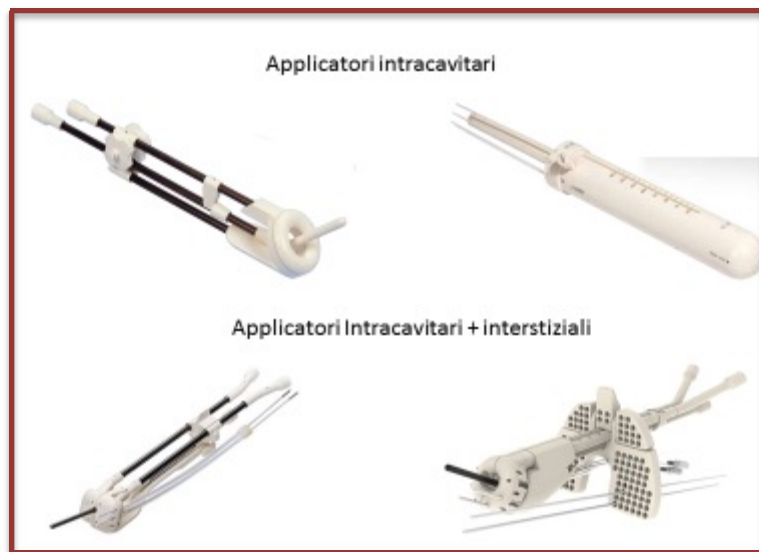
## Aims

The use of brachytherapy (BT) is part of the standard of care for patients with locally advanced cervical cancer (LACC).



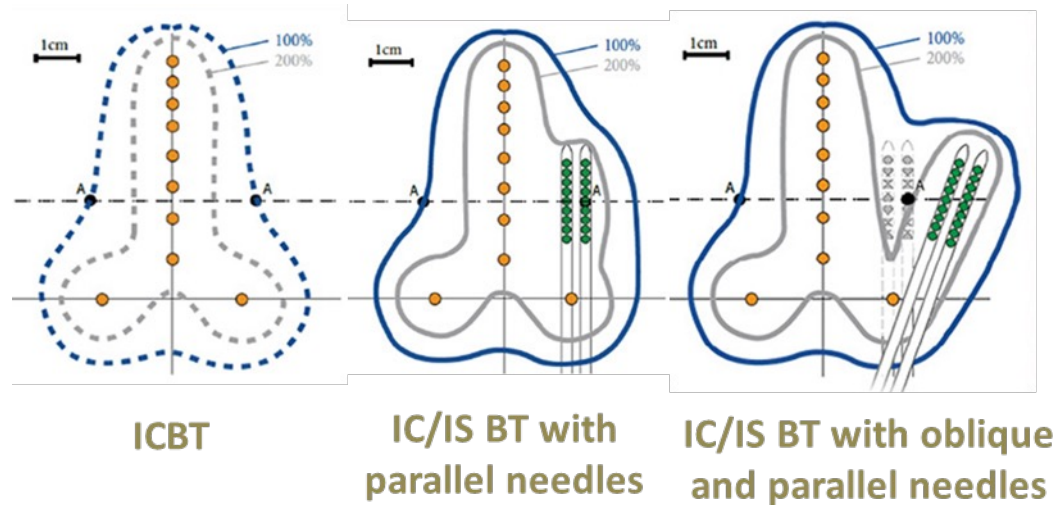
## Aims

Depending on the residual disease (size and homogeneity of the HR-CTV) at the time of BT, interstitial technique is often required, using needles with intracavitary device.



## Aims

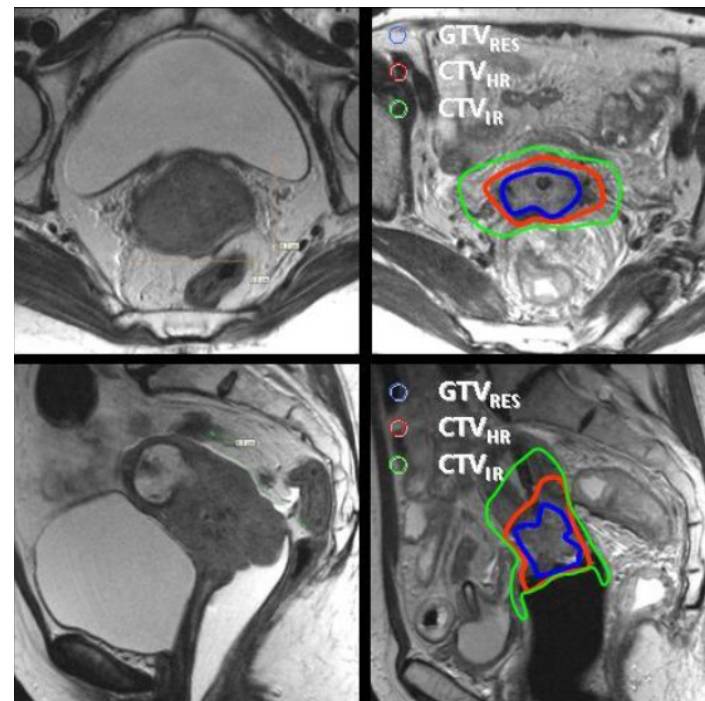
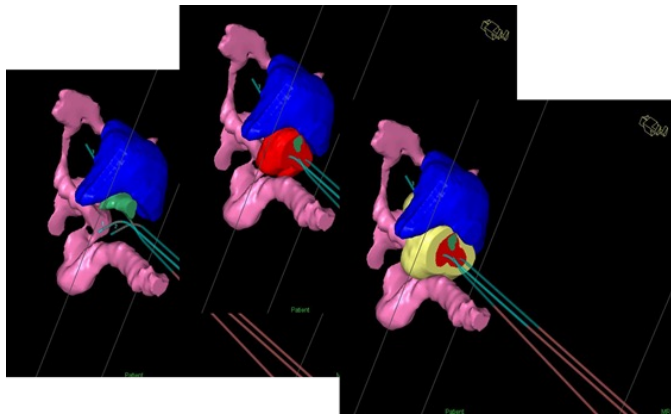
Here we want to evaluate feasibility and dosimetric outcomes in LACC patients with a residual disease at the time of BT who received intracavitary BT (ICBT) at first fraction and interstitial BT (ISBT) for the remaining fractions.





Methods

From *january 2021 to may 2023*, 23 patients with LACC were treated at our center with ICBT at first fraction and ISBT for all the following fractions.



For each fraction, MRI was acquired and targets were delineated.

## Methods

All the target definitions and treatment plans were evaluated following GEC-ESTRO guidelines.



- GTV
- HR-CTV
- IR-CTV

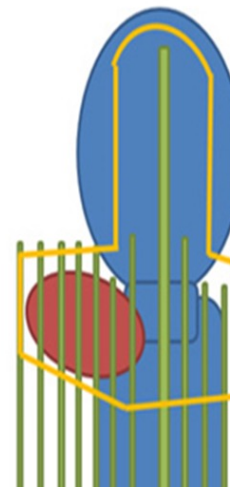
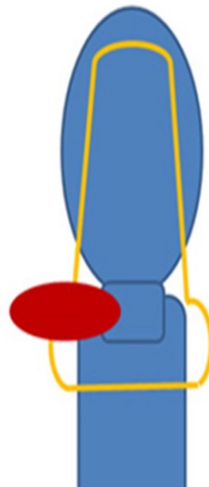
For OARs, constraints were fulfilled, excepting the cases when the evaluated organ was infiltrated by the initial disease.



- Bladder
- Rectum
- Sigma
- Bowel

## Methods

Interstitial needles, together with the intracavitary tandem, were selected for patients with large and inhomogeneous cervical lesions (mean GTV volume of 6.82 cc at the time of BT).





Methods

First fraction, comprehensive of gynecological examination and imaging, helped determine where to insert needles to guide the delivered dose.

EQD2 was calculated for targets and OARs taking into account external beam doses and BT doses.

Target	D90 CTV <sub>HR</sub> EQD2 <sub>10</sub>	D98 CTV <sub>HR</sub> EQD2 <sub>10</sub>	D98 GTV <sub>res</sub> EQD2 <sub>10</sub>	D98 CTV <sub>IR</sub> EQD2 <sub>10</sub>
Planning Aims	> 90 Gy < 95 Gy	> 75 Gy	>95 Gy	> 60 Gy
Limits for Prescribed Dose	> 85 Gy	-	>90 Gy	-
OAR	Bladder D2cm <sup>3</sup> EQD23	Rectum D2cm <sup>3</sup> EQD23	Recto- vaginal point EQD23	Sigmoid D2cm <sup>3</sup> EQD23
Planning Aims	< 80 Gy	< 65 Gy	< 65 Gy	< 70 Gy*
Limits for Prescribed Dose	< 90 Gy	< 75 Gy	< 75 Gy	< 75 Gy*

## Results

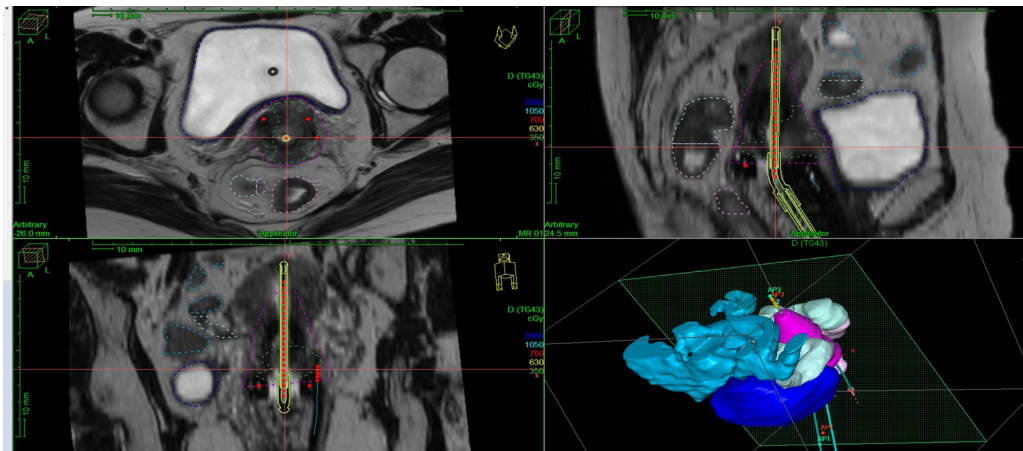
At the end of the whole treatment 66.7% of the patients had **CTV-HR D98>75 Gy** while 70.4% achieved **CTV-HR D90>85 Gy**.

## **OARs:**

- Bladder D2cc **<80 Gy in 55.6%** and **<90 Gy in 100%** of cases;
- Rectum D2cc **<65 Gy in 44.4 %** and **<75 Gy in 96.3%** of cases;
- Sigmoid D2cc **<70 Gy in 66.7 %** and **<75 Gy in 92.6%** of cases

Conclusions

It has become clinical practice in our center to treat LACC patients with ICBT at the first fraction and then evaluate the need for ISBT.



This approach allows a better and safer programming of the following fractions thanks to the precise assessment of the relationship between device, disease and OARs.

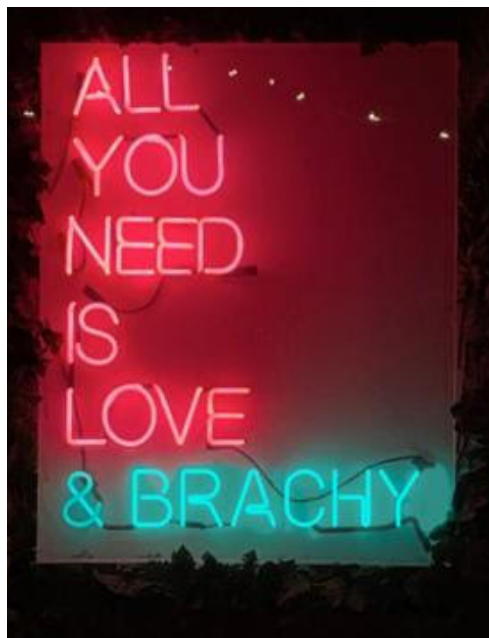


### Conclusions

Despite the potential dosimetric disadvantage due to not using needles in the first fraction, the latter guarantees to achieve satisfactory dosimetric objectives for targets and OARs.

FONDAZIONE IRCCS ISTITUTO NAZIONALE DEI TUMORI		Regione Lombardia		External Beam RT (EBRT)							
first name:	n	number of fractions n	25	TARGETS EQD2 <sub>0</sub> [Gy]	1.77	OARs EQD2 <sub>0</sub> [Gy]					
surname:	c	dose / fraction d [Gy]	1.8	number of fractions n	0.00	0.00					
patient ID:		TOTAL EBRT1	45.0	dose / fraction d [Gy]	0.0	0.0					
treatment:	cervico-vaginal	TOTAL EBRT1-EBRT2	45.0	TOTAL EBRT2	44.3	43.2					
High Dose Rate Brachytherapy (HDR BT)											
TARGETS		GTV		HR-CTV		R-CTV					
	D98 [cGy]	EQD2 <sub>0</sub> [Gy]	D98 [cGy]	EQD2 <sub>0</sub> [Gy]	D98 [cGy]	EQD2 <sub>0</sub> [Gy]	D98 [cGy]				
dose fraction 1 d <sub>1</sub>	687.11	9.7	606.4	8.12	721.61	10.4	347.1				
dose fraction 2 d <sub>2</sub>	884.57	13.9	645.89	8.86	776.39	11.5	413.1				
dose fraction 3 d <sub>3</sub>	834.95	12.8	632.91	8.61	778.75	11.5	428.56				
dose fraction 4 d <sub>4</sub>	910.95	14.5	732.91	10.58	818.75	12.4	520.12				
dose fraction 5 d <sub>5</sub>		0.0		0.0		0.0	0.0				
dose fraction 6 d <sub>6</sub>		0.0		0.0		0.0	0.0				
TOTAL HDR	3317.6	50.8	2618.1	36.2	3095.5	45.8	1708.9				
TOTAL	78.2	95.08	71.2	80.4	76.0	90.0	62.088				
		<95Gy		>75Gy		>95Gy ->90Gy	<60Gy				
						>85Gy					
OARs		Bladder		Rectum		Sigmoid/Bowel		Med.Phys.		Rad.Onc.	
	D2cc [cGy]	EQD2 <sub>0</sub> [Gy]	D2cc [cGy]	EQD2 <sub>0</sub> [Gy]	D2cc [cGy]	EQD2 <sub>0</sub> [Gy]	D2cc [cGy]	EQD2 <sub>0</sub> [Gy]			
dose fraction 1 d <sub>1</sub>	597.49	10.7	300.31	3.6	276.51	3.2	3.2		CT	CD	
dose fraction 2 d <sub>2</sub>	518.51	8.5	275.42	3.2	245.83	2.7	2.7		TG	BP	
dose fraction 3 d <sub>3</sub>	534.47	8.9	279.28	3.2	264.84	3.0	3.0		TG	BP	
dose fraction 4 d <sub>4</sub>	512.36	8.3	256.12	2.8	245.32	2.7	2.7		CT	CD	
dose fraction 5 d <sub>5</sub>		0.0		0.0		0.0	0.0				
dose fraction 6 d <sub>6</sub>		0.0		0.0		0.0	0.0				
TOTAL HDR	2162.8	36.5	1111.1	12.9		1032.5	11.5				
TOTAL	66.6	79.7	56.1	56.1	55.3	54.7					
		<80Gy		<65Gy		<70Gy					
		<90Gy		<75Gy		<75Gy					
OTHER INFO		Date	Imaging	Volumes (cm3)		Applicator	Needles	TRAK	Prescription Dose (cGy)		
				GTV	HR-CTV						
fraction 1	20.02.2023	RM	10.249	46.2	App Personalizzato	0	0.376	700		Ginevra	
fraction 2	23.02.2023	RM	8.79	35.66	App Personalizzato	2	0.326	700		Ginevra	
fraction 3	27.03.2023	RM	6.86	33.38	App Personalizzato	2	0.327	700		Ginevra	
fraction 4	01.03.2023	RM	4.23	31.3	App Personalizzato	2	0.327	700		Ginevra	
fraction 5											
fraction 6											

NOTE: registrare il volume HR-CTV (se opportuno anche il GTV) e i corrispondenti indicatori dosimetrici dopo aver sottratto l'applicatore



# GRAZIE PER L'ATTENZIONE!

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