

Official Annual Meeting of Indian Brachytherapy Society

9TH ANNUAL CONFERENCE OF INDIAN BRACHYTHERAPY SOCIETY 2019 (IBSCON 2019) PROCEEDINGS

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on behalf of Indian Brachytherapy Society**

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The 9th Annual Conference of the Indian Brachytherapy Society (IBS), 2019 (IBSCON 2019) was conducted by the Department of Radiation Oncology, Father Muller Medical College, Mangalore and the Indian Brachytherapy Society in Mumbai between 30th August and 1st September 2019. The theme of the conference was “**Precision Brachytherapy – The Art and Science**”.

The pre-conference workshop was conducted at the Decennial Memorial Hall, Father Muller Medical College, Mangalore on 30th August 2019. The theme of the workshop was “**Masterclass in Brachytherapy – Demonstration of common brachytherapy procedures**”. The workshop focused on the procedural demonstration of brachytherapy techniques in the 4 common sites of brachytherapy, i.e. oral tongue, cervix, breast and soft tissue sarcoma. Experts from the field of brachytherapy across the country deliberated on these topics and demonstrated the applicators and catheters used in the procedure and discussed the finer aspects and challenges encountered during the brachytherapy procedures. The delegates had a hands-on feel of various applicators, catheters and needles used for brachytherapy at various sites. Various gynaecological brachytherapy applicators and their clinical usage with resultant advantages were demonstrated in the cervical cancer brachytherapy session. Accelerated partial breast irradiation techniques and video demonstration were a real treat to all the enthusiastic delegates. Approximately 130 delegates including radiation oncologists, postgraduate residents, medical physicists, and brachytherapy trade delegates registered for the workshop and participated and interacted during the masterclass workshop discussion.

With a 120-year long history, brachytherapy has indeed preserved its value in an era of sophisticated teletherapy due to its unmatched optimal way of highly conformal radiation therapy to the target volume and also by sparing the normal surrounding tissues. With the evolution of advanced application in brachytherapy techniques, applicators, imaging, QA tools and software, this time-tested form has increased its effectiveness much further. We are also fortunate to be a witness to high level evidence in breast, cervix, prostate, head and neck cancers in favour of brachytherapy. With an intention to revisit and relish the essence of brachytherapy, IBSCON 2019 was dedicated to these common sites with the theme of “**Precision Brachytherapy – The art and science**” with experts from all over India and abroad sharing the finer details and practical tips.

The conference was conducted at Decennial Memorial Hall, Father Muller Medical College, Mangalore. The conference was attended by 160 delegates, who included radiation oncologists, postgraduate medical residents, medical physicists, radiation therapy technologists, brachytherapy trade delegates, and allied health students.



Photo 1. Group photo taken at the end of meeting



Photo 2. Keynote address awardee Dr Christine Haie-Meder being felicitated by IBS President and Secretary

The highlight of the conference was the keynote address by Dr Christine Haie-Meder, a pioneer in brachytherapy from Gustave Roussy Institute, Paris, delivering the address on “Clinical relevance of brachytherapy in the global oncological landscape” During the inaugural ceremony, Dr Christine Haie-Meder appreciated the spirit of IBSCON and likened it to GEC-ESTRO.

Details of various scientific sessions are shown in the programme schedule below.

On day 1 of the conference, the leading experts in the field demonstrated their experiences and results in brachytherapy for cervical cancers and head and neck cancers and provided the IBS guidelines for the same. Sessions on current brachytherapy status and talk on medical events and patients’ safety enlightened the day. Interactive sessions with the experts and delegates helped in clarification of technical and practical queries. Vendors of brachytherapy equipment presented talks on the latest innovations and developments from the manufacturer’s perspective. The 1st day concluded with the IBS general body meeting.

Day 2 of the conference had the meet-the-expert session where various opportunities and grants provided by IBS were elaborated in detail. Two highly informative sessions on breast and gastrointestinal brachytherapy provided insight about brachytherapy in these sites. During the conference, out of the 25 abstracts received, the 9 best abstracts were discussed for the best paper and 4 selected posters had a poster discussion session. The Indian Brachytherapy Society would like to acknowledge the Department of Radiation Oncology, Father Muller Medical College, Mangalore for hosting the 9th Annual Conference of IBS 2019. We also sincerely thank the official sponsors of IBSCON 2019, Elekta, Varian and Ariane, for their generous contribution. Finally, IBS would like to thank all the national faculty, IBS Executive Committee, all the IBS members, and others for their contribution in making IBSCON 2019 a grand success!

**Pre-Conference Workshop – 30th August 2019
Masterclass in Brachytherapy**

1.45-2.00 p.m.	Welcome Address and Programme Overview	
2.00-3.00 p.m.	Oral Tongue Cancer	Dr. Manish Chandra Moderator: Dr. Hasib A.G.
3.00-4.00 p.m.	Advanced Brachytherapy procedures for Cervical Cancer	Dr. Bhavana Rai Dr. Umesh Mahantshetty Moderator: Dr. Kamalaksha Shenoy
4.00-4.15 p.m.	Coffee break (<i>DM Hall</i>)	
4.15-5.00 p.m.	APBI – Brachytherapy	Dr. Tabassum Moderator: Dr. Krishna Sharan
5.00-6.00 p.m.	Soft Tissue Sarcoma	Dr. DN Sharma Moderator: Dr. Sourjya Banerjee

IBSCON 2019 – SCIENTIFIC SCHEDULE

Day 1 – 31 st August 2019		
8.00-9.00 a.m.	Registration and breakfast (<i>Food Court</i>)	
9.00-9.10 a.m.	Welcome address and Programme Overview	
Session 1. Current Brachytherapy Status		
Chairs: Dr. RL Bhalavat, Dr. K Thayalan, Dr. Donald Fernandes		
9.10-9.35 a.m.	Relevance of Brachytherapy in Current Oncology Practice	Dr. Tanvir Pasha Bangalore
9.35-10.00 a.m.	Medical events and patient's safety in brachytherapy	Dr. T Ganesh Delhi
10.00-10.40 a.m.	Inauguration	
10.40-11.00 a.m.	Coffee break (<i>Food Court</i>)	
Session 2. Cervical Cancer Brachytherapy Update		
Chairs: Dr. Subrata Saha, Dr. Krishna Sharan		
11.00-11.20 a.m.	Brachytherapy beyond point 'A'	Dr. Umesh Mahantshetty Mumbai
11.20-11.45 a.m.	ICRU 89	Dr. Geetha S Narayan Bangalore
11.45-12.00 a.m.	IBS Guidelines	Dr. Umesh Mahantshetty Mumbai
Session 3. Key note address		
Chairs: Dr. RL Bhalavat, Dr. Umesh Mahantshetty		
12.00-1.00 p.m.	Keynote address – Dr Christine Haie-Meder	
1.00-2.00 p.m.	Lunch (<i>Food Court</i>)	
Session 4. Head and Neck Brachytherapy Update		
Chairs: Dr. DN Sharma, Dr. Geetha S Narayan		
2.00-2.20 p.m.	Oral Cavity and oropharyngeal cancers	Dr. Hasib A G Mangalore
2.20-2.40 p.m.	Principals of planning and plan selection in head and neck brachytherapy	Dr. Sathiyam Bangalore
2.40-3.00 p.m.	IBS Guidelines	Dr. R L Bhalavat Mumbai

Session 5. Updates from Brachytherapy Vendors		
Chairs: Dr. Manish Chandra, Dr. P U Saxena		
3.00-3.15 p.m.	ELEKTA	
3.15-3.30 p.m.	VARIAN	
3.30-3.45 p.m.	ARIANE	
3.45-3.50 p.m.	Coffee break (<i>DM Hall</i>)	
Session 6. Brachyphysics		
Chairs: Dr. K Thayalan, Dr. Umesh Mahantshetty		
3.50-4.10 p.m.	Brachytherapy Isotopes beyond Iridium	Dr. K Thayalan Chennai
4.10-4.35 p.m.	Commissioning and QA	Video presentation
4.35-5.00 p.m.	Principles of Interstitial BT	Dr. Rituraj Upreti Mumbai
5.00-5.30 p.m.	Poster Review	
5.30-6.30 p.m.	IBS General Body Meeting	
7.00-10.30 p.m.	Dinner	
Day 2 – 1st September 2019		
8.15-8.30 a.m.	Breakfast (<i>DM Hall</i>)	
8.30-9.00 a.m.	Meet the experts Brachytherapy fellowships	IBS President / Secretary
Session 7. Breast Brachytherapy Update		
Chair: Dr. Kavitha		
9.00-9.20 a.m.	Updates on Breast BT techniques	Dr. Krishna Sharan Manipal
9.20-9.40 a.m.	APBI With BT	Dr. Vikram Maiya Bangalore
9.40-10.00 a.m.	APBI BT planning	Dr. Rituraj Upreti Mumbai
Session 8. GI Brachytherapy Update		
Chairs: Dr. Umesh Mahantshetty, Dr. Sourjya Banerjee		
10.00-10.20 a.m.	Oesophageal Cancers	Dr. Prahlad Yathiraj Chennai
10.20-10.40 a.m.	Hepato-biliary cancers	Dr. PU Saxena Mangalore
10.40-11.00 a.m.	Ano-rectal Cancers	Dr. Kirthi Koushik AS Bangalore
Session 9. IBS Abstract Presentation		
Chairs: Dr. Geetha S, Dr Tanvir P, Dr Umesh M, Dr Manish C		
11.10-11.30 a.m.	Poster discussion (3 min each + 1 min discussion)	
11.30-12.25 p.m.	Best paper presentations (5 min each + 2 min discussion)	
12.30-12.45 p.m.	Valedictory function	
12.45 p.m.	Lunch (<i>Food Court</i>)	

Abstracts for presentations

Best oral paper presentation session

A prospective, comparative study of response and toxicities of HDR intraluminal brachytherapy with chemoradiation and chemoradiation alone in the treatment of carcinoma esophagus

Dr. Abhishek Krishna, Dr. Hasib AG, Dr. MS Vidyasagar, Dr. Donald Fernandes, Dr. MS Athiyamaan, Dr. Sandesh Rao, Dr. Sharaschandra Mr. Shridhar CH, Dr. Kalyani M

Department of Radiation Oncology, Father Muller Medical College, Mangalore

Purpose: To evaluate and compare response and toxicities in patients treated with chemoradiation alone and chemoradiation with high dose rate intraluminal brachytherapy in carcinoma of the esophagus.

Material and methods: A total of 60 patients were included in the study and were divided randomly into 1 arms - CT RT arm and ILBT arm with 30 patients each. CT RT received definitive chemoradiation 54 Gy in 27 fractions with concurrent weekly cisplatin and ILBT received definitive chemoradiation 50 Gy in 25 fractions with concurrent weekly cisplatin followed by two sessions of intraluminal brachytherapy of 4 Gy each. Evaluation of early response was done 1 and 6 months after completion of chemoradiation on a clinical basis and by upper GI endoscopy. Dysphagia scores were recorded before, on completion of treatment and in the 1st and 6th month of follow-up. Acute gastro-intestinal toxicities (fistula, stricture, ulcer, esophagitis) were evaluated.

Results: The patient characteristics were comparable in both the arms. Dysphagia to solids was more frequent in the chemoradiation alone arm compared to the ILBT arm at the end of 1 month and 6 months. 80% had a complete clinical response in the CT-RT arm compared to 86.7.3% in the ILBT arm. Grade 3 stricture was more frequent in arm 2. Grade 2 ulceration was seen only in arm 2. None of the patients developed fistula or pneumonitis. There was improvement in dysphagia in both the arms with 50% in arm 1 and 67% in arm 2 tolerating a normal solid diet at the end of 6 months.

Conclusions: Chemoradiation with ILBT for carcinoma of the esophagus provides excellent local control of the disease with acceptable toxicities when compared with chemoradiation alone.

MRI-based image-guided brachytherapy for cervical cancer in an Indian tertiary centre – a single institute's experience.

Dr. Jaswanthi AR, Dr. Richa Tiwari, Dr Geeta SN

Department of Radiation Oncology, Vydehi Institute of Medical Sciences, Bangalore

Purpose: To analyse the outcomes of MR based IGBT in our hospital.

Material and methods: 151 biopsy proven cervical cancer patients with stage IB2-IVA were recruited at Vydehi Hospital, Bangalore. MRI scans were acquired as a routine investigation for all the patients before the start of whole pelvic EBRT. All the patients had undergone EBRT to a dose of 45-50 Gy in conventional fractionation or VMAT with concurrent weekly chemotherapy. Radiologically if there was presence of pelvic LN \geq 1 cm in the greatest dimension, then the node was boosted to 55 Gy by EBRT. Brachytherapy was undertaken under spinal anaesthesia after the 3rd week of EBRT if the patients were suitable. IC OR IC-ISBT was done. After assessing the extent of residual disease under anaesthesia, appropriate MR-compatible intracavitary applicators (tandem-ovoids/tandem-ring/tandem with ring and interstitial needles/tandem with cylinder and interstitial needles) were used for the procedure. The 1st fraction of BT in all patients was planned on MRI and the subsequent fractions on CT simulated images.

Results:

Local control	Percentage	<i>p</i>
Stage		
IB2	100	.00224
IIA	100	
IIB	92.68	
IIIA	84.61	
IIIB	80.64	
IVA	42.85	
Dose (Gy)		
< 85	85.45	.0626
\geq 85	94.73	
Size (cc)		
< 5	92.98	.004
\geq 5	84.61	
HRCTV (cc)		
< 35	94.23	.0611
\geq 35	84.31	

Local control	Percentage	<i>p</i>
LN		
+	78.57	.043
-	93.47	
Histo		
SQCC	88.48	.657
Adeno	71.42	
OTT (d)		
≤ 49	87.95	.98
> 49	87.69	

Conclusions: MRI-based image-guided brachytherapy for cervical cancer, following the recommendations by GEC-ESTRO, has been a feasible technique at our institution. Excellent local control rates with minimal toxicity have been achieved. Stage-wise EQD₂ has been sufficiently achieved for the majority of the cases. With further experience, we might be able to escalate the tumour doses in all our cases without compromising the OARs.

Multicatheter interstitial brachytherapy (MIBT) based accelerated partial breast irradiation (APBI) dosimetric comparison with volumetric arc external beam radiotherapy (VMAT) – an observational study

Dr Kiron G, Dr Amina, Dr Krishna Sharan, Dr Anshul Singh, Dr Stanley Mathew, Dr Umesh V, Mr Sarath

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Purpose: To dosimetrically compare multicatheter interstitial brachytherapy (MIBT) and intensity modulated radiotherapy (VMAT) for accelerated partial breast irradiation (APBI) with the focus on dose to organs at risk.

Material and methods: Twenty-one patients with early stage breast cancer treated in the Department of Radiotherapy and Oncology, Shirdi Sai baba Cancer Hospital, KMC Manipal during 2016-2019 with MIBT were selected for the study. For each patient an additional VMAT treatment plan was created using the same CT data and contours as used in MIBT plans. OARs included ipsilateral and contralateral breast, lung of both sides, skin, and heart. The CTV was created from the outlined lumpectomy cavity. The PTV in VMAT plans was generated from CTV with the addition of an isotropic 5 mm margin. The prescribed dose was 34 Gy in 10 fractions for both techniques. From dose-volume histograms, quality parameters, tumour coverage, homogeneity including volumes receiving a given dose (e.g. V₁₀₅, D₉₅) and doses to specified volumes (e.g. V₅, D_{0.01}, D_{0.1}, D₁) were calculated and compared.

Results: Mean ipsilateral lung dose was lower in MIBT, with D_{0.01}, D_{0.1}, D₂ and V₁₀ being statistically significant with D_{0.01}, D_{0.1}, D₂, V₁₀ being 63%, 59%, 47%, 24% in

MIBT compared to 84.1%, 81%, 74%, 45% in the VMAT plan. Heart doses were also lower in MIBT compared to VMAT, with D_{0.1}, D₂, V₁₀ showing statistical significance. D_{0.1}, D₂, V₁₀ for heart were 19.5%, 16.3% and 10% in MIBT respectively whereas they were 29.6%, 25.2% and 22% respectively with the VMAT plan. Maximum dose received to skin was 93% in MIBT versus 81% in VMAT.

Conclusions: The target volume can be appropriately irradiated by both techniques, but MIBT generally spares normal tissues and organs at risk better than VMAT. Whether this dosimetric benefit translates into clinical benefit needs to be ascertained.

Quantitative estimation of inter-fractional movement of sigmoid colon during intracavitary brachytherapy in cancer cervix and its dosimetric impact: a prospective study

Dr Bhukya Swetha, Dr Kushal Goswami, Dr Anish Bandyopadhyay, Dr Amitabha Manna

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Purpose: Stated as the most mobile part of the LGI tract and within clinical and dosimetric preview of ICBT in cancer cervix, sigmoid colon dosimetry and toxicity is less studied with respect to its rectal counterpart. With endoscopic data suggesting a proportional increase of ICBT related LGI toxicity to RSJ, our study aimed at estimation of sigmoid movements with respect to interfractional imaging and its dosimetric impact.

Material and methods: 7 patients (FIGO IB3-IIIB) were treated with EBRT (50 Gy/25 #) using 3D-CRT and ICBT (7 Gy/3 #) ± nodal boost. During ICBT, sigmoid contouring was done from the RSJ to the superior aperture of the lesser pelvis. A standard bowel and bladder protocol was followed. Sigmoid movement was measured in 2 axes (anterosuperior, postero-inferior) based on a line from the top of the symphysis pubis to the S1-2 junction in sagittal section (Rt and left lateral) based on the AP line from the symphysis pubis to the coccyx (axial section). Interfractional differences in volumes (cc) in each quadrant were correlated with D_{2cc} of that quadrant and the sigmoid. A 2 cm radius sphere was contoured from the central tandem with cranial extent of 1 cm and caudally up to cervical os. The impact of rectal volume, arching/crossing of sigmoid over the uterus was estimated.

Results: Most interfractional movement was observed in the anterosuperior quadrant (range, 4-38 cc). Ratio of total volume/D_{2cc} was lower in the postero-inferior quadrant (mean 4.08, range, 1.43-11.5). Dosimetric data of 21# analysed suggest that minimal rectal volume (12 cc) is needed below which sigmoid D_{2cc} increases. Postero-inferior volume (*p* = 0.08) and D_{2cc} (*p* = 0.08) correlated with Sphere D_{2cc}. Sigmoid colon arching over uterus was

more associated with higher D_{2cc} ($p = 0.06$) than crossing of the sigmoid ($p = 0.1$).

Conclusions: The anterosuperior part has more inter-fractional motion but does not effect OAR dose. Increase of volume in the posteroinferior part leads to overall D_{2cc} increase. Minimal rectal filling is needed below which posteroinferior volume increases lead to a higher sigmoid dose. Arching of the sigmoid over the uterus needed optimisation in terms of dwell positions.

Xray vs. CT-based planning for intracavitary brachytherapy in carcinoma cervix – a dosimetric analysis

Dr. Maria Sophia J

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Purpose: To compare intracavitary brachytherapy planning methods for cervical cancer, based on X-ray films (conventional plan) and CT sections (CT plan). The comparison focused on target volume coverage (CTV) and dose received by the organs at risk (OARs), by representing point doses as per International Commission on Radiation Units and Measurement (ICRU) 38 and dose volume histograms (DVHs) from 3D planning (Gynaecological GEC ESTRO recommendations).

Material and methods: Patients with carcinoma of the uterine cervix treated between May 2017 and December 2018 with radical chemoradiation and high dose rate (HDR) ICBT were included. All the patients were treated with a standard dose of external beam radiotherapy (46-50 Gy) with weekly 40 mg/m² inj. cisplatin, followed by HDR ICBT to a dose of 7.5 Gy in 3 sessions. Each application underwent both X-ray and CT simulation and the dosimetric data for 74 conventional and CT-based ICBT plans were analyzed. Point A and ICRU 38 rectal and bladder points were defined on the conventional plan and CT plan. The doses to bladder and rectum were compared in both the plans. The gross tumor volume (GTV), clinical target volume (CTV) and organs at risk (OARs) were contoured on the CT plan according to GEC-ESTRO guidelines. With the same source configuration, the dose was prescribed to point A and CTV and respective volume coverage, $D_{1cc,2cc}$ bladder and rectum volumes were compared.

Results: The mean of ICRU bladder point and rectal point in the conventional plan (X-ray) were 44.4% (3.33 Gy) with SD of $\pm 19.84\%$ (1.48 Gy) and 48.10% (3.6 Gy) $\pm 13.71\%$ (1.02 Gy). The mean of ICRU bladder and rectal point in the CT plan was 62.95% (4.72 Gy) $\pm 22.71\%$ (1.70 Gy) and 59.66% (4.47 Gy) $\pm 17.16\%$ (1.28 Gy). In the current study when the dose was prescribed to point A in CT, the bladder D_{1cc} was 78.83% (5.9 Gy) with SD of $\pm 17.83\%$ (1.33 Gy), bladder D_{2cc} was 68.58% (5.14 Gy) $\pm 14.71\%$ (1.10 Gy) and rectum D_{1cc} was 67.14% (5.03 Gy) $\pm 20.15\%$ (1.51 Gy), rectum D_{2cc} was 59.57% (4.46 Gy) $\pm 17.9\%$ (1.34 Gy). When the dose is prescribed to CTV the

bladder D_{1cc} was 60.85% (4.56 Gy) with SD of $\pm 19.82\%$ (1.48 Gy), bladder D_{2cc} was 51.49% (3.86 Gy) $\pm 15.70\%$ (1.17 Gy) and rectum D_{1cc} was 41.57% (3.11 Gy) $\pm 22.78\%$ (1.7 Gy), rectum D_{2cc} was 36.53% (2.73 Gy) $\pm 19.5\%$ (1.46 Gy). The CTV coverage in the point A based plan was 91.67% ± 7.09 and in the volume based plan was 96.58% ± 3.44 .

Conclusions: Comparison of orthogonal X-ray-based and CT-based HDR ICBT planning is feasible. The ICRU bladder and rectal point doses in 2D planning were lower compared to the ICRU bladder and rectal point doses in 3D planning. But D_{1cc} , D_{2cc} of bladder and rectal doses were lower in 3D planning compared to 2D planning due to normalization in 2D planning and optimization in 3D planning and also it was observed that the tumor coverage was better in 3D volume based planning compared to 2D point A based BT planning.

Influence of bladder volume and central tandem length on optimum dose to OAR in intracavitary brachytherapy of carcinoma cervix

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Dr. Donald Fernandes, Mr. Sridhar CH, Dr. MS Athiyamaan,
Dr. Sandesh Rao, Dr. Sharaschandra

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Purpose: The aim of this study is to find an optimum bladder volume and central tandem length to minimize the dose to pelvic OARs.

Material and methods: This study was done in 2017-2018 among 40 patients who received concurrent chemoradiation of dose 50 Gy in 25#, 2 Gy per fraction over 5 weeks along with weekly inj. cisplatin of dose 40 mg/m² followed by 3 sessions of HDR intracavitary brachytherapy with dose 7.5 Gy per session once weekly from the Department of Radiation Oncology, Father Muller Medical College with histologically proven squamous cell carcinoma of cervix. The bladder, rectum, and sigmoid DVH parameters such as $D_{0.1cm^3}$, D_{2cm^3} and D_{10} , D_{30} , D_{50} were recorded in terms of percentages of the planning aim dose after each treatment plan.

Results: Bladder: High-dose parameters of bladder are increased by increasing the bladder volume. Tandems longer than 4 cm increase the dose to the bladder up to about 4% (of the planning aim dose) more, compared to the shorter tandems; Rectum: Rectum dose reaches its minimum and maximum levels for < 70 cc and 110-170 cm³ bladders, respectively. Choosing a longer tandem leads to about 5% higher dose to the rectum. Rectum volume does not have any drastic influence on the dose to rectum for patients whose tandems are ≤ 4 cm. Sigmoid: When the bladder volume is 70-75 cm³, the sigmoid dose will be minimum. Tandem lengths have a direct relationship with sigmoid dose.

Conclusions: In conclusion, choosing a bladder with a volume of about 70 cm³ or less and tandem length of < 4 cm is recommended when taking into account the high dose volume parameters for bladder, rectum, and sigmoid.

Response in patients with locally advanced carcinoma cervix treated with interstitial brachytherapy

Dr. Lanisha Sequeira, Dr. Hasib AG, Dr. Vidyasagar, Dr. Donald, Dr. Athiyamaan, Dr. Sandesh, Dr. Sharaschandra, Dr. Mohsina

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Purpose: To evaluate response in locally advanced carcinoma cervix patients who could not be adequately treated with intracavitary brachytherapy.

Material and methods: 40 patients from January 2014 to July 2019 received HDR interstitial brachytherapy using the MUPIT applicator under transabdominal USG guidance under spinal/epidural anaesthesia. The dose of 12 Gy to 22.5 Gy was delivered in 3 to 6 fractions.

Total no. of patients	40
Median age	50
Histology: SCC	36
Histology: adenocarcinoma	4
Stage IIB	8
Stage IIIA	2
Stage IIIB	17
Stage IVA	5
Ca vaginal vault/stump	8
EBRT 50 Gy/25#	28
EBRT 46 Gy/23#	8
Chemotherapy: Cisplatin	30
Chemotherapy: Paclitaxel + Cis	5
Chemotherapy: Carboplatin	5

An invasive procedure was performed under spinal and epidural anesthesia. EUA – external genitalia, vaginal length, tumor dimension, parametrial and paravaginal tissue involvement, and relationship of the tumor to the uterus and other pelvic organs as well as a thorough per-rectal examination is done. Foley's catheterization is done with the balloon filled with 7 ml of contrast. Bladder filling with 200 cc of normal saline and clamp the Foley catheter. The uterine sounding is done to assess the uterine length. The uterine tandem is placed into the uterine cavity. The vaginal length is determined and the vaginal obturator is inserted over the tandem until its tip abuts the cervical os. The base plate is fixed to the obturator with screws and to the perineum by stitches at 4 corners. A guide needle is inserted 3-4 cm beyond the clinically

palpable disease, starting with the needles near the rectum, with one finger inside the rectum to avoid rectal perforation. The number and position of the needles are according to the extent of the disease. All the needle insertions are done under transabdominal USG guidance and the position is checked. The cover plate is placed over the template to prevent the needles' displacement.

Results: 20 patients had a complete response. 10 patients had a partial response and 10 patients had disease progression.

Conclusions: In conclusion, HDR-ISBT gives better results in locally advanced carcinoma cervix not suitable for intra cavitory brachytherapy.

Comparison of EBRT vs. interstitial brachytherapy boost in postBCS patients

Dr. Paul Simon, Dr. Hasib AG, Dr. MS Vidyasagar, Dr. Donald Fernandes, Dr. MS Athiyamaan, Dr. Sandesh Rao, Dr. Sharaschandra, Mr. Shridhar CH, Dr. Mohsina, Dr. Shreeba

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Purpose: This study aims to compare dosimetry and skin toxicity of patients treated with local tumour bed dose escalation (boost) with photon beams (external beam radiation therapy – EBRT) vs high-dose-rate interstitial brachytherapy (HDR-BT) after breast-conserving treatment in women with early-stage breast cancer.

Material and methods: Eligibility criteria: Age ≥ 18 years. Histologically confirmed carcinoma of breast, unilateral early breast cancer. Undergone breast conservation surgery followed by whole breast radiation therapy. Three dimensional conformal radiotherapy was planned as per conventional methods. The whole breast was treated to a total dose of 40 Gy in 15 consecutive daily fractions, 2.67 Gy per fraction. An additional boost dose was delivered either by ISBT or EBRT. Skin contouring was defined as a thick layer of 5 mm underneath the skin surface (Nandi M *et al.*). All patients underwent clinical examination before irradiation, weekly during the treatment course and every three months for the first year. Acute skin toxicity was assessed during and at the completion of RT and after 1 month, 3 months, and 6 months. Late effects and cosmetic outcome were evaluated at each clinical visit.

Results: Skin toxicities during the end of radiation: grade 1 toxicity in 6 (1/5), grade 2 toxicity in 11 (6/5), grade 3 toxicity in 3 (6/0), grade 4 toxicity: nil. Observed in 1 patient in arm that received tumour bed boost by EBRT. Recurrence occurred within 1 cm from the surgical scar.

Conclusions: Tumour bed boost by interstitial brachytherapy has shown better tumour control with lower grades of skin toxicity.

Best poster presentation session

Precision brachytherapy – ISBT in recurrent leiomyosarcoma

Dr Samantha Dsouza, Dr Hasib AG, Dr Donald Fernandes,
Dr MS Athiyamaan, Dr Sharaschandra Shankar,
Dr Sandesh Rao, Dr Mohsina, Dr Sheeba

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Purpose: Soft tissue sarcomas (STS) are a comparatively rare heterogeneous group of tumours with different distinct histopathological subtypes. It accounts for less than 1% of all adult solid neoplasms. Due to rarity of the occurrence and heterogeneous pathological varieties, STS have aggressive biological behaviour and high potential for local recurrence after surgery. Adjuvant radiation therapy, either preoperative or post-operative, improves local control rates after local resection or limb sparing surgery, eliminating the need for amputation in case of limb sarcoma.

Case details: A 45-year-old woman was diagnosed with fibroid uterus and underwent total abdominal hysterectomy after which she developed a swelling on the anterior abdominal wall. Wide local excision was done.

IHC showed features suggestive of myofibroblastic proliferation reactive for vimentin, CD99, SMA, and CD34; Ki-67 labelling index is 20%.

The patient developed recurrent swelling at the same site twice and was excised.

She received adjuvant radiation therapy 66 Gy with 33 fractions completed. She was on regular followup when she noticed a swelling in the right scapular region which was increasing in size. On examination, right shoulder – 7 × 6 cm swelling present over the right scapular region. Skin over the swelling normal. Firm to hard in consistency. Fixed to underlying structure. MRI: mass lesion measuring 11 × 10.5 × 5.3 cm noted in the right infraspinatus muscle. Inferiorly fat planes with teres minor were maintained. Anterior portion of infraspinatus muscle was normal. She underwent wide local excision under GA with per op insertion of 8 ISBT catheters. HPE showed malignant soft tissue neoplasm – epithelioid malignant peripheral nerve sheath tumor. The external contours of the CTV were delineated on each CT slice in the 3D treatment planning system (Oncentra Brachytherapy Mode). HDR brachytherapy was performed using an ¹⁹²Ir remote after loading the system with the treatment device Nucletron micro-Selectron using the prescription point at 1 cm from the catheters and a total prescription dose of 15 Gy in 5 sessions, 3 Gy per session, delivered through 8 ISBT catheters. Brachytherapy was started on POD 6. The patient is on regular follow-up and presently has no complaints and is planned for EBRT.

Results: For function preservation in the management of STS, a wide margin resection is the common sur-

gical procedure. Local recurrence rates after conservative surgery alone have been unacceptably high (30-75%). Combination of surgery and ISBT with/without EBRT improves local and distant control with acceptable late toxicities.

Conclusions: In this case report we noted that local recurrence rate had significant control with ISBT. Long term follow-up is necessary to comment regarding late recurrences.

Shot in the eye: surface brachytherapy for eyelid tumours

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Purpose: Sebaceous carcinoma of the eyelid is a rare malignant tumor of the sebaceous gland.

The general principles of radiation to skin cancer also apply to sebaceous carcinoma of the eyelid. We report the use of surface mould brachytherapy for adjuvant radiotherapy in eyelid tumors.

Case details: A 73-year-old man presented with a small, progressively increasing painless papule of 2 × 1.5 cm exuberant vegetative nodule with central crusting over the margin of the left upper eyelid. After detailed evaluation and review, left upper eyelid tumor excision and reconstruction was done. Histopathology revealed sebaceous carcinoma grade II with intraepithelial pagetoid spread and positive medial and lateral margin. Therefore, adjuvant RT was planned. Surface-mold technique was considered. With the help of a thermoplastic mold (to hold the catheter in place) and a wax spacer (as a separator), a single catheter was placed each time along the surgical scar and fixed to it with adhesive plaster. A corneal shield was used to further increase the distance between the catheter and the cornea. The patient received 40 Gy/9# over 5 days, with ≥ 6 hour inter-fraction interval.

Results: He tolerated the treatment well, with grade I skin reaction following treatment completion. At one-year follow-up, the patient has no recurrence, and has no long-term sequelae of brachytherapy.

Conclusions: Surface-mold brachytherapy could be considered in selected patients with eyelid tumors.

Promising outcomes of perioperative interstitial brachytherapy in treatment and prevention of keloid recurrence

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Purpose: The aim of this study is to analyse treatment outcomes of perioperative interstitial brachytherapy in keloids.

Material and methods: From 2014 to 2016, 20 patients who underwent keloid excision and were referred for adjuvant RT were analysed retrospectively. After excision of keloid, brachytherapy tubes were placed subcutaneously before closing the wound and radiation to a total dose of 15 Gy in 3 divided doses was delivered on day 1, 2, 3 of surgical excision.

Results: The median age was 29 years (range: 18-71); 50% of patients were male and 50% female. The most common site of keloid was ear lobe (40%) followed by sternum (20%) and forearm (15%). The most common presenting complaints were cosmesis, itching and pain. 30% of patients had received a previous treatment, either surgery or corticosteroid injection, and had recurrence in the same region. The median size of keloid before brachytherapy was 80 mm³. The median followup was 3.8 years. 5 patients had local recurrence (26%) and median time to recur was 8 months. 1 patient had recurrence outside the treated region. No treatment-related complications (infection) were seen in any patients. All patients reported symptomatic and cosmetic improvement at 1-year follow-up.

Conclusions: Peri-operative radiation therapy can reduce the risk of keloid recurrence. Our study shows good local control of 73%, hence suggesting that HDR brachytherapy with 3 fractions of 5 Gy each is a safe and effective dosage schedule for postoperative adjuvant radiotherapy in management of keloids.

Retrospective study of outcomes in carcinoma cervix involving up to lower third of vagina

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Purpose: According to FIGO staging of cervical cancer, involvement of the lower third of the vagina is considered as IIIA. There are limited studies of treatment outcomes in these patients. Narrowing of the vagina from invasion of tumor may cause improper intracavitary brachytherapy (ICBT) leading to an insufficient radiation dose delivered. Therefore, these patients have higher risk of persistent or local recurrence (LR). The usual tandem

and ovoids application does not provide a sufficient dose to the lower third of the vagina. So either tandem and cylinder or interstitial brachytherapy is done in these patients. The study aims to observe the response to radiotherapy.

Material and methods: Patients with confirmed pathological results of squamous cell carcinoma cervix and who received complete radiation therapy.

Results: The total number of patients included in this study was 56, of whom 5 patients were lost to follow up, so 51 patients were included. Median followup of these patients is 36 months (12-72 months). 11.7% (6) patients developed grade 2 proctitis, 1.9% (1) developed grade 3 proctitis. 3.9% (2) patients developed grade 3 small bowel toxicities. No urinary bladder toxicities were noted. All the toxicities are observed in the patients treated with tandem and cylinder.

Conclusions: There is a smaller amount of data regarding stage IIIA carcinoma cervix. In our study we provided the results attained in our institute. The toxicity of radiotherapy is less when interstitial brachytherapy is done than tandem cylinder.

Retrospective study on pattern of failure following brachytherapy in carcinoma cervix: a single institutional experience

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Purpose: Despite advances in treatment of patients with locally advanced cervical cancer, failure and recurrence seem to be greatly increasing. The aim was to analyse factors affecting recurrence, failure and pattern of care in carcinoma cervix patients undergoing treatment in our institution.

Material and methods: We retrospectively investigated the treatment charts of 230 patients with carcinoma cervix in the Department of Radiation Oncology in Madras Medical College who completed treatment during February 2009 and January 2014 with minimum follow-up of 6 months.

Results: Out of 230 patients, 68 (29.5%) patients presented with failure and recurrence. Among those, 68.21% of patients did not complete radiation, 32% of patients did not receive radiation in an adjuvant setting. The most common sites of distant failure were paraaortic node (42%), lung (31%), bones (15%), liver (12%). Treatment time, EBRT and ICBT gap and mean EQD₂ point A were found to be associated with a better outcome in terms of DFS.

Conclusions: Both failure and recurrence depend upon age and stage at presentation, point A cumulative dose and treatment gap. The failure can be reduced if the patients are educated about the importance of completing both EBRT and brachytherapy without defaulting the treatment. An interesting result was that follow-up pattern had a significant impact on DFS period.

Primary vaginal carcinoma in a long standing uterine prolapse treated with radical surgery, EBRT and surface mould brachytherapy: a case report

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Purpose: Intracavitary vaginal brachytherapy is a common adjuvant treatment for superficial vaginal cancer invading a depth up to 0.5 cm (3,4). Custom applicators are required when standardized applicators do not conform or adapt to the patient's specific anatomy. For patients with a small vaginal cavity, standard applicators to achieve conformity at the vaginal apex may be impossible.

Case details: This case study describes a custom surface mould applicator designed to deliver adjuvant HDR vaginal brachytherapy to a patient with long standing proctentia with vaginal cancer, post-surgery and post EBRT. A custom surface mould applicator was created to deliver intra-vaginal brachytherapy to a postvaginectomy patient with a vaginal cavity of 1 cm in length.

Results: The patient tolerated the treatment with grade 1 skin toxicity and clinically no recurrence after 3 months of followup.

Conclusions: The custom applicator was a viable and safe solution that resulted in an acceptable dose distribution and was well tolerated by the patient.

Dosimetric and volumetric parameters in multicatheter breast brachytherapy

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Purpose: Interstitial brachytherapy is the most effective way of delivering radiation therapy in the case of boost to the tumour bed or in APBI in treatment of breast carcinoma. Strict dosimetric and volumetric parameters are to be maintained during treatment planning in order to obtain a good coverage and to reduce the dose to OARs. Here we report the parameters used in dosimetric and volumetric evaluation during treatment planning of breast ISBT.

Material and methods: 8 patients who underwent multi-catheter breast ISBT were included in the study. All patients were treated by a MicroSelectron HDR Brachytherapy unit; treatment was planned in the Oncentra planning system with graphical optimization. The dosimetric and volumetric parameters evaluated were as follows:

Dosimetric parameters

Definition/calculation

DNR – dose non-uniformity ratio $V_{1.5} \times PD/VPD$

DHI – dose homogeneity index $(VPD - V_{1.5} \times PD)/VPD$

OI – overdose volume index $V_2 \times PD/VPTV$

CI – coverage index $V_{100}/100$

COIN – conformal index $PTVPD/VPTV \times PTVPD/VPD$

Volumetric parameters

VPD volume irradiated by prescribed dose

V_{150} volume receiving 150% of the dose

V_{90} and V_{50} of ipsilateral non-target breast

Results: The DNR value was 0.626. The DHI was 0.3736. The coverage index was 0.67. The OI was 0.339 and COIN was 0.526. The dose to OAR was well under the normal constraints.

Conclusions: DNR, DHI, OI, CI, COIN, V_{150} , VPD should be routinely used in all treatment planning of breast ISBT.

A case report on use of simultaneous application of endobronchial and oesophageal brachytherapy for locally advanced carcinoma esophagus

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Purpose: Oesophageal cancer is the sixth leading cause of cancer-related mortality worldwide because of its high malignant potential. It accounts for approximately 6% of all gastrointestinal malignancies. Most commonly it presents as locally advanced disease or as advanced or metastatic disease with 5-year survival approximately 5-10%. The prognosis is poor with median survival of 9 months. Surgery is the preferred primary treatment for operable patients. However, a substantial number of patients are unfit for surgery. In locally advanced oesophageal cancers definitive chemoradiation therapy has been shown to improve survival rates.

Case details: A 63-year-old man presented with dysphagia to semisolids and solids since 2 months and severe dyspnoea since 5 days. Dyspnoea increased on exertion with KPS-20. Clinically there were reduced breath sounds on the left side of the lung. UGI-scopy showed a 11 cm lesion in the mid oesophagus and biopsy showed squamous cell carcinoma. CT scan showed irregular circumferential wall thickening of the mid oesophagus noted from T5-T8 level approximately 9 cm, with proximal dilatation of the oesophagus with infiltration of the left main bronchus noted with collapse of the left lingula, lower lobe and reduced volume of the left upper lobe. Due to the poor general condition of the patient, he was planned for palliative radiotherapy with endobronchial and oesophageal intraluminal brachytherapy, bronchoscopy showing proliferative growth in the left main bronchus. A bronchoscopy guided endobronchial 6F catheter was placed. He received 8 Gy in a single fraction through 2 catheters – 1 endobronchial and 1 oesophageal by HDR brachytherapy.

Results: Post brachytherapy he had a good response to treatment was able to tolerate solids. UGI-scopy suggested no evidence of disease in the oesophagus and chest X-ray showed re-expansion of the collapsed left lung and also improvement of his general condition with KPS-80. Due to good clinical and radiological response, he was planned for radical treatment. He received 9 cycles of weekly paclitaxel and carboplatin. Post-chemotherapy UGI-scopy revealed residual disease, a 6 cm lesion in the mid-esophagus and he also had complaints of dysphagia to solids. In view of the above he was treated concurrently with CTRT 50 Gy in 25 fractions with weekly dual agent chemotherapy carboplatin and paclitaxel. The patient tolerated the treatment well and is able to tolerate a solid diet. Currently he is on follow-up.

Conclusions: HDR endobronchial brachytherapy is an effective method to relieve airway obstruction and oesophageal brachytherapy for relief of severe dysphagia promptly for patients and may be considered as a boost for obstructive lesions before chemotherapy and external beam radiation therapy.

Implementing image guided adaptive brachytherapy for carcinoma cervix – institutional experience

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Purpose: To report the early disease and toxicity outcomes of image guided adaptive brachytherapy for carcinoma cervix treated with definitive radiotherapy.

Material and methods: This retrospective study considered patients with carcinoma cervix treated with curative radiotherapy at our institute. Patients who received image guided brachytherapy using cross-sectional imaging after completion of external-beam radiotherapy were selected. Patients not completing the planned treatment, partially treated with simulator based planning and those receiving palliative RT were excluded. The disease status of the patients at the last follow-up and the toxicities experienced were recorded.

Results: Between April 2017 and December 2018, 34 patients were treated with image guided brachytherapy. Mean age of the patients was 60.7 years (range, 39-78 years). The majority (22; 59.5%) of the patients had stage IIB disease. The average HR-CTV volume at the time of brachytherapy was 19.6 cc (range, 5.7-99 cc). The D_{2cc} to bladder and rectum were 3.4 (range, 1.2-6.2) Gy and 4.4 (range, 1.4-9.9) Gy, respectively. Mean dose to PIBS was 2.1 Gy (range, 0.5-11.2). Among the 24 patients with a mean followup of 9.7 months (range, 2.1-19.2 months), residual/recurrent disease was noted in two (8.3%). Rectal and bladder toxicities were mild (\leq grade 2) and noted in two patients each. However, vaginal stenosis was frequent (41.7%), with 3 patients (12.5%) experiencing total stenosis.

Conclusions: Early results of implementing image guided brachytherapy in carcinoma cervix at our institute have been promising, with good locoregional control and low gastrointestinal and genitourinary toxicity, excepting a high incidence of vaginal stenosis.

Patterns of care and outcome in elderly cervical cancer patients: a special focus on brachytherapy

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Purpose: The mean age of the general population has been prolonged and incidence of cancer in elderly patients has increased. The purpose is to evaluate outcome of brachytherapy as an integrated part of treatment of elderly patients with cervical cancer.

Material and methods: This is a retrospective analysis of 69 patients of 70 years of age diagnosed with cervical cancer with stage 2B-4A (FIGO) from Jan 2012 to Jan 2016 presented at Radiation Oncology OPD, MMC. They were treated by HDR brachytherapy as part of their treatment.

Results: The median age was 75 years (range 70-80 years). 91% of patients presented with squamous cell carcinoma. The mean point A EQD₂ dose was 82 Gy (range: 80-85). The mean bladder and rectal point doses were 78 Gy and 67 Gy respectively. Rectal, small bowel and urinary tract complications were observed in 15 (21.7%), 3 (4.3%) and 9 patients (13.04%) respectively. Rectal complications grade 1, grade 2, grade 3 incidences were 8 (11.5%), 5 (7.2%) and 2 (2.8%) respectively. Urinary complications grade 1 and grade 2 incidences were 5 (7.2%) and 4 (5.7%) respectively. With a median follow-up of 3 years, 10 patients developed distant metastases and 9 others presented local relapses. The 3-year specific overall survival rate was 86.9% and the corresponding disease-free survival rate was 72.5%.

Conclusions: Elderly women with cervical cancer tolerated brachytherapy well and had excellent local disease-free survival and specific survival rates. Age did not influence the effectiveness of brachytherapy in elderly patients and brachytherapy should be considered whenever possible, even in elderly patients presenting with cervix cancer.

Clinical outcomes and dosimetric parameters of chemoradiation including CT based simulation and HDR brachytherapy with tandem-ovoid applicators for cervical cancer patients – single institution experience

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Purpose: High-dose-rate intracavitary brachytherapy has been widely used in the treatment of cervical cancer. In the analysis of RT outcome it is important to assess not only local tumor control, but also the incidence of late sequelae caused by treatment. The risk factors of late sequelae include age, stage, EBRT dose, no. of HDR/ICB treatments, point A dose and rectal and bladder reference doses.

Material and methods: Between January 2016 and December 2017, 50 patients who survived more than 12 months after treatment were studied. Initially, they were treated with EBRT 50 Gy-50.4 Gy using a telecobalt 60 machine in 25-28 fractions to the whole pelvis along with weekly chemo inj. cisplatin 40 mg/m² after which HDR ICB was performed using a ⁶⁰Co remote afterloading device after CT simulation with tandem-ovoid applicators. Point A standard dose prescribed was 6-8 Gy/#. Patient and treatment related factors were evaluated for rectal complications and bladder complications along with local control, progression-free survival, and overall survival.

Results: The probability of rectal and bladder complications showed better correlation of dose response with increasing total ICRU rectal and bladder dose. Mean point A dose was 76.6 Gy by EQD₂. Mean bladder and rectal doses were 70.2 Gy and 60.6 Gy. The mean follow-up period was 30 months. 2-year LC, PFS, OS rates were 90.86 and 82% respectively. PFS for patients with FIGO stage 2B-3B was 91.8% vs. 33.3%. OS at 2 years was 86.4% vs. 50%. Late grade 3-4 toxicities, mainly gastrointestinal and urinary complications, were observed in 11 patients (22%).

Conclusions: This study demonstrated the values of ICRU rectal and bladder mean doses achieved in HDR ICB. Patients who had a rectal dose and bladder dose greater than 68 Gy and 73.5 Gy EQD₂ were at risk of late sequelae.

Brachytherapy: the prequel

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Brachytherapy is a treatment modality as old as the history of radiotherapy in cancer treatment. The word brachytherapy is derived from the word *brachy*, which means "short" in Greek. Following the discovery of X-rays by Wilhelm Konrad Roentgen in 1895, the French physicist Henri Becquerel discovered that uranium spontaneously emitted rays similar to Roentgen rays. Shortly after the discovery of radioactivity, Pierre Curie recommended the use of radioactive isotopes for cancer treatment in the early 1900s. In 1903, the first gynecological brachytherapy was described by Margaret A. Cleaves in New York. Treatment of prostatic disease with radium was first reported in Paris, at a meeting of the Association Française d'Urologie in October 1909. In New York, Robert Abbe from St. Luke Memorial Hospital performed the first radium implant following the excision of a tumor in 1905. After October 1910, Marie Curie started dose calculations of radioisotopes and dose calculations in brachytherapy applications based on the mg-radium equivalent (mgRaEq). After the First World War, radium treatment of carcinoma of the cervix was started by Gösta Forssell in 1910.

The Nobel Prize in Chemistry in 1911 was awarded to Marie Curie for the discovery of the elements radium and polonium, by the isolation of radium. Methods of intracavitary brachytherapy were described by the schools of Stockholm and Paris in 1914 and 1919, respectively.

In 1960, Henschke described afterloading technique for tumors of the uterus and cervix, which reduced exposure to staff. In 1952, the MD Anderson technique was presented by Gilbert Fletcher and the Fletcher applicator, which was used in vaginal colpostate in the United States, was identified in 1953. Prof. Dr. Reha Uzel and Ulrich Henschke pioneered gynecological tumors and brachytherapy in Turkey and performed the intracavitary application with Manchester type rubber ovoid and intrauterine applicators in 1955 with Seyfet tin Kuter. In 1957, eye tumors were treated with Sr-90 eye applicators. In the 1960s, Drs Scardino and Carlton at Baylor College of Medicine in Houston, TX, performed permanent prostate brachytherapy using Au-198 interstitial implantation or ¹²⁵I. In 1969, the ⁶⁰Co remote controlled Cathetron device was established at the radiotherapy department at Istanbul Faculty of Medicine. Thus, HDR brachytherapy was started. In the 1970s, the dosimetry rules of the Paris system were determined by Chassagne, Pierquin, and Dutreix in interstitial treatment. In 1983, Hans Henrik Holm introduced the use of trans-rectal ultrasound to visualize the permanent placement of ¹²⁵I seeds via needles inserted through the perineum directly into the prostate. In the 1990s, interstitial applications were started with low-dose ¹⁹²Ir wires in the Department of Radiotherapy in the Istanbul Medical Faculty of Istanbul University. In 1985, Blasko and Ragde began the first transperineal, ultrasound-guided approach in the United States. Since

2000, permanent prostate brachytherapy has been performed under the guidance of transperineal ultrasound with LDR ^{125}I sources at the Oncology Institute of Istanbul. As a result, brachytherapy, with its 120-year long history, preserved its importance.

A case report of hidradenocarcinoma of pinna treated with surface mould brachytherapy

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Purpose: Hidradenocarcinoma is a rare malignant adnexal tumor which arises from the intradermal duct of eccrine sweat glands. Head and neck are common sites. It can rarely occur on the extremities. It is an aggressive tumor with spread to region lymph nodes and distant visceral metastasis.

Case details: An 80-year-old woman was evaluated for complaints of painless swelling over left ear pinna, starting in April 2018; excision was done in April 2018. A similar lesion reappeared below the previous site; excisional biopsy was done in October 2018, suggestive of spindle cell tumour, grade 3.

[Margins uninvolved, LVI negative, mitotic activity = 3-4/HPF] Feb 2019, the patient again developed a swelling in the infra-auricular and parotid region, along with matting of submandibular and upper jugular lymph nodes. USG done shows hyperechoic lesion, 3.5 × 2.7 cm with compressible internal echoes. Incision and drainage was done. Biopsy s/o recurrent spindle cell carcinoma of vascular origin. CT neck shows nodular enhancing lesion measuring 2 × 1.2 cm in the helix of the pinna along with multiple enlarged cervical lymph nodes at level 2 and 3, the largest measuring 35 × 17 mm, along with heterogeneous enhancing necrotic lesions posterior to the left parotid 3 × 3.5 cm, likely lymph node complex. The patient was diagnosed with recurrent spindle cell carcinoma of the left pinna and underwent wide local excision and modified radical neck dissection on 29.04.19. HPE s/o malignant adnexal tumor, differential diagnosis, 1 - trichilemmal carcinoma, 2 - hidradenocarcinoma [Size 1.2 × 0.6 × 0.5 cm] [Perineural invasion present, extranodal extension present, lymph nodes 5/48, medial margin free of tumour. Clearance for SM-0.7, DM-0.2 cm, LM-0.4, IM-0.2 cm].

Results: The patient has been on follow-up for 5 months with no local recurrence with grade 1 skin reaction.

Conclusions: Hidradenocarcinoma is a very aggressive tumour characterised by high frequency of locoregional recurrence and notorious behaviour for distant metastases. The wide excision surgery along with adjuvant radiation therapy will be helpful in better local control. Patients should be closely kept on regular follow-up.
