EP-1943
CT-guided radioactive seed implantation for locally recurrent rectal cancer
H. Wang[1], F. Yi[1], J. Wang[1], H. Yuan[2], J. Li[1], Y. Jiang[1], S. Tian[1]
[1]*Peking University Third Hospital, Cancer Center, Beijing, China*
[2]*Peking University Third Hospital, Radiology, Beijing, China*

Purpose/Objective: To evaluate the response rate, local control, overall survival, pain control rate and treatment-related toxicity of CT-guided radioactive seed implantation for locally recurrent rectal cancer (LRRC).

Materials and Methods: From September 2003 to October 2011, thirty one patients with locally recurrent rectal cancer received ^{125}I or ^{103}Pd seeds implantation under CT guidance in our center. Each patient underwent three-dimentional treatment planning pre-implantation and dosimetric verification post-implantion. The range of activity of seed was from 0.40 to 1.40 mCi, and the range of seeds number was from 33 to 137. The range of $D_{90\%}$ was from 75.91 to 159.32 Gy.

Results: The follow-up rate was 93.5%, the median follow-up time was 15.7 months (4.2 ~ 98.1 months). The response rate of pain relief was 95.2%. The overall response rate was 51.6%, in which complete response rate was 16.1% and partial response rate was 35.5%. The 1, 2 and 3 year local control rates were 32.3%, 11.3% and 11.3%, respectively. The median local control survival was 8.0 month. The 1, 2 and 3 year survival rates were 67.6%, 36.0% and 7.5%, respectively. The median overall survival was 21.5 months. Six patients were observed complications.

Conclusions: CT-guided radioactive seed implantation is a minimally invasive treatment for locally recurrent rectal cancer with satisfied efficacy and tolerable complications. It is another treatment option for locally recurrent rectal cancer, especially for those with previous pelvic radiation. These findings need to be validated by conducting further studies with larger cohorts.

ELECTRONIC POSTER: BRACHYTHERAPY TRACK: MISCELLANEOUS

EP-1944
The quality of the laparoscopically performed interstitial bladder implantation
A.M. Nap - van Klinken[1], S.J.E.A. Bus[1], T.G. Janssen[1], M.P.R. Van Gellekom[1], G. Smits[2], E.M. Van de Steen-Banasik[1]
[1]*ARTI - Arnhems RadioTherapy Inst., Brachytherapy, Arnhem, The Netherlands*
[2]*Rijnstate Hospital, Urologie, Arnhem, The Netherlands*

Purpose/Objective: To evaluate the quality of interstitial bladder brachytherapy implanted by the laparoscopic method.

Materials and Methods: In the Arnhem Radiotherapy Institute (ARTI) the catheters for interstitial bladder brachytherapy have been implanted laparoscopically since June 2009, from 2010 da Vinci Robot assisted.
Since the implementation of a PDR afterloader in 1998, 79 patients were treated with interstitial bladder brachytherapy; the latter 42 were implanted using the laparoscopical method.
The quality of laparoscopic implants was compared with those of the laparotomy group. The evaluation was performed using the Implant Specific Parameters: Homogeneity Index (HI) and Overdose Index (OI).
10 patients were randomly chosen from both populations, group 1: laparotomy and group 2: laparoscopy.The mean HI and OI of both groups were compared.

Results: The mean HI and OI in group 1 are 57,3 and 19,8 %, in group 2 respectively 57,0 and 21,3%. Statistical analysis using an unpaired t-test results in p-values of 0,16 for HI and 0,85 for OI. Those are not significant.
The important improvement in the recent technique is decrease of treatment interruptions due to kinking catheters causing frequent source track obstructions. What was a serious disturbance in laparotomy is almost non-existing in laparoscopy. Dealing with those mechanic obstructions resulted in a high workload and treatment interruptions making it sometimes necessary to create a new treatment planning and even impossible to continue the treatment in one case.

Conclusions: Interstitial bladder brachytherapy performed in a laparoscopically inserted implant is an elegant technique providing a high implant quality and an easy manageable treatment.

EP-1945
Surgery combined with attachment of 125I seeds to the tumor bed for treatment of locally advanced pancreatic cancer
Y. Gao[1], J.J. Wang[1]
[1]*Department of Radiation Oncology, Peking University 3rd Hospital, Beijing, China*

Purpose/Objective: To study the therapeutic value of pancreatic oduodenectomy with combination of ^{125}I seeds attached to the tumor bed for locally advanced pancreatic cancer.

Materials and Methods: Fourteen patients with locally advanced pancreatic cancer were enrolled in this study. All the patients were administrated laparoscopy under general anesthesia and pancreaticoduodenectomy with combination of ^{125}I seeds ,which were evenly put in gelatin sponges, attached to the tumor bed. Fourteen patients received a D_{90} (at least 90% of the tumor volume received the reference dose) ranging from 72.44 to 148.79 Gy, with a median of 96.76Gy.

Results: No patience died during the perioperative period. Organs at risk received considerably low dose,(The maximum dose spinal cord received ranged from 0.95 Gy to 4.61 Gy, with a median of 2.07 Gy; for the stomach, the ranges of D30, D10, D0.1 were 0.15-21.42 Gy,0.04-42.59 Gy, 0.60-79.28 Gy, with respective medians of 0.44 Gy, 0.75 Gy, 3.00Gy; for the intestinal, the ranges of D30, D10, D0.1 were 0.97-4.41 Gy,1.45-9.61 Gy, 3.27-112.08 Gy, with respective medians of 1.95 Gy, 4.35 Gy,10.50 Gy)which may reduce acute toxicities.

Conclusions: As the combination of pancreas resection and the ^{125}I seed attachment is safe, feasible and practical, centers have the conditions could do some attempts.

EP-1946
Study and development of a iridium-192 seed for use in ophthalmic cancer
M. Rostelato[1], C. De Souza[1], F.S. Peleias Jnr[1], C.A. Zeituni[1], F.R. Mattos[1], M.A.G. Benega[1], J.A. Moura[1], A. Feher[1], O.L. Costa[1]
[1]*Instituto de Pesquisas Energeticas e Nucleares, Radiotherapy, Sao Paulo, Brazil*

Purpose/Objective: Brachytherapy is a treatment that uses seeds that contain radio nuclides in its interior. The objectiveof this work is the study and development of anIridium-192 seed for use in ophthalmic brachytherapy. It has been reported the use of iridium-192 in form of wires for treatment ophthalmic tumors such as retinoblastoma [1] and choroidal melanoma [2,3]with effective results when compared to other radionuclides.

Materials and Methods: We use a platinum-iridium alloy of 50 cm composed of 25% iridium and 75% platinum, platinum encapsulated with 100% (Goodfellow). The activation process was carried iridium in the IEA-R1. The analysis of platinum-iridium alloy (Ir-Pt) was performed using the Electron Microscopy (SEM).

Results: Activation in the reactor requires the development of an aluminum device (Fig 1). The average activity was 700uCi with 11.4% variation. The core analysis was performed by a scanning electron microscope Phillips XL-30.

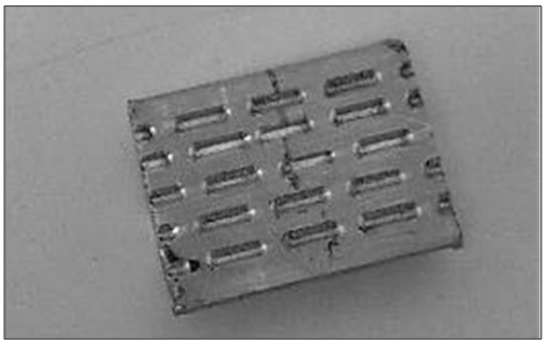

Figure1: Aluminum device that was inserted in the IEA-R1 Nuclear Reactor activation tubes. Note the blank spaces were the wires are placed.
This analysis has shown us, besides the elemental composition of the sample, the weight percentage of each element that constituent the sample and the atomic percentage of each element. The data

correspond to the inner part of the platinum-iridium alloy wire. The result was: Iridium: 25.35% mass percentage and 25.64% Atomic Percentage, Platinum: 74.65% mass percentage and Atomic Percentage 74.36%.
After laser welding, the seed was approved in all leakage tests.

Conclusions: The work achieved its goal of creating a source of iridium-192 for ophthalmic cancer treatment. As future work, we should perform, spectroscopically, the evaluation of energies emanating from the seeds of iridium-192, dosimetry calculations including Monte Carlo simulations.

References:

[1] AMENDOLA, B.; ET AL. Analysis of treatment results in 36 children withretinoblastoma treated by scleral plaque irradiation.Journal of Radiation.vol.17, p. 63–70, Jan.1989.
[2] VALCÁRCEL,F.; VALVERDE, S.; CÁRDENES, H.;CAJIGAL, C.; Magallón, R.; REGUEIRO, C.;ENCINAS, J. L.; ARAGÓN,G. Episcleral iridium-192 wire therapy for choroidalmelanomas. International journal of radiation oncology, biology,physics, vol. 30, no. 5. pp. 1091–7,01-Dec-1994.
[3] BRADY, L.W.; HERNANDEZ, J. C. Brachytherapy of choroidal melanomas. Strahlentherapie undOnkologie : Organ der Deutschen Röntgengesellschaft ... [et al],vol. 168, no. 2. pp. 61–5, Feb-1992.

EP-1947

CT-guided 125I seed implantation on treatment of recurrent soft tissue sarcoma after multimodal treatment

L. Lin[1], J.J. Wang[1], Y.L. Jiang[1], N. Meng[1], S.Q. Tian[1], R.J. Yang[1], C. Liu[2]
[1]*Peking University Third Hospital, Department of Radiation Oncology, Beijing, China*
[2]*Peking University Third Hospital, Department of Radiology, Beijing, China*

Purpose/ObjectiveL: Soft tissue sarcoma are marked by a poor outcome, especially recurrence. This study aimed to explore whether the adoption of interstitial ^{125}I seed implantation in patients with recurrence soft tissue sarcoma after surgery combined with radiation.

Materials and Methods: We conducted a retrospective review of 31 patients (median age, 64 years; range, 6-79 years; 14male, 17 female) with local recurrence after surgery combined with radiation of soft tissue sarcoma, who underwent ^{125}I seed implantation in our department from 2003 to 2012. Details of tumor volumes were assessed using CT 1to 2 days prior to seed implantation, and pretreatment planning was received. Theseeds were implanted using a Mick applicator (Mick Radio-Nuclear Instruments Inc., Mount Vernon, N.Y., USA), and the distance between the centers of any 2 seeds was maintained at approximately 1.0 cm. Tumor response was initially evaluated at 4 weeks and thereafter at intervals of 2 to 3 months. Disease status was assessed by physical examination, liver function tests, and full blood and platelet counts. Radiological measurement of disease progression, which included ultrasound examination and CT scans, was performed. All the patients were followed up until expiration. The median follow-up period, which was measured from the time of seed implantation, was 21 months (range, 3–53 months). All statistical analyses were conducted using SPSS version 19.0 (SPSS, Chicago, Ill., USA).

Results: The activity of the ^{125}I seeds ranged from 0.5–0.8 mCi (median, 0.7 mCi). The prescribed doses delivered to 90% of the gross tumor volume as defined by treatment planning system using a dose-volume histogram (D90) was 143-184 Gy (median, 170 Gy). The median overall survival time was 34 months (3-43 months), and 1- and 3- year survival rates were 86.3% and 65.3%, respectively. There was no serious complication observed. Of the 31 patients, 8 (25.8%) patients still alive, 17 (54.8%) died of multihematogenous metastasis, and 6 (19.4%) patients died of pneumonia.
No serious complications were observed following seed implantation. There was no evidence of bone or soft tissue necrosis, carotid rupture, neuropathy, blood vessel damage, or late complications (RTOG grades IV and V).

Conclusions: In conclusion, the results of our study suggest that Percutaneous ^{125}Is eed implantation is a safe and effective salvage treatment for recurrent soft tissue sarcoma after surgery combined with radiation.

EP-1948

Keloids treatment brachytherapy

S. Roldán[1], E. Cuervo[1], O. Pons[1], F. Celada[1], F. Lliso[1], A. Soler[1], R. Palomo[1], J. Pérez[1], A. Tormo[1]
[1]*Hospital Universitario La Fe, Radiotherapy, Valencia, Spain*

Purpose/Objective: Keloids lesions grow beyond the scar and their relapse is not related neither to the wound nor contracture. They are produced by an increase of connective tissue, consisting of large and clustered collagen fibers, with and absence of myofibroblasts. Different treatments may be used: Surgery, acupressure, corticosteroids and surgery associated with steroids, radiotherapy or brachytherapy (BT). The aim of this paper is to present our results with this technique.

Materials and Methods: Retrospective review of 95 patients (121 lesions) diagnosed with keloids, and counting on a minimal of 1 year follow-up. Treatment consisted of lesion excision and the placement of a plastic catheter , as close as possible to the scar, both introduced and taken out through healthy tissue. We initiate treatment in the 30-90 minutes after the procedure. With low rate dose(LRD) 15 Gy are administered to 5 mm from the source, and from 2002 high rate dose (HDR) was administered in 4 fractions of 3 Gy (at least separated by 4 hours) to 7 mm deep, being their BED to 5 mm deep 17,5 and 24 Gy respectively. CTV = scar plus 5 mm margin.

Results: 95 patients were treated , 50 (63 lesions) with LRD and 45 (58 lesions) with HDR. Classification by locations was: Chest 40 lesions, abdomen 13, neck 11, fascies 16 , extremities 18 , ears 20 and breast 3 . We have only had two relapse, located on earlobe, rescued by a second application. Acute toxicity 20% (G1-G2) not G3. Just remark one case of scar dehiscence.

Conclusions: Based on our results, BT obtained excellent cosmesis and local control results (121/119), without relevant complications and/or anatomical restrictions.

EP-1949

Palliative combined treatment by high-dose-rate brachytherapy and stents in patients with esophageal cancer.

M. Kanikowski[1], J. Skowronek[1], A. Chichel[1]
[1]*Greater Poland Cancer Centre, Brachytherapy, Poznan, Poland*

Purpose/Objective: The aim of this work was to analyze the result of palliative HDR-BT in patients with advanced esophageal cancer after stent insertion

Materials and Methods: 1.Fifty patients with unresectable, advanced esophageal cancer,age ranged from 44 to 79 years (mean: 59.3 yrs). 2. Most of patients have tumor localized in third median part of thoracic esophagus. Upper and lower thoracic part of esophagus in 4 (8%) and 14 (28%) cases respectively. 3. The most frequent range of tumors length was 5 - 10 cm, length below 5 cm and above 10 cm consists of 10 (20%).4. The main complaints were dysphagia (grade I was most frequently found in 26 (52%) cases and grade II in 15 (30%) cases. 5. Squamous cell carcinoma and adenocarcinoma were two most frequent types of esophageal tumors (68% and 12% respectively). Treatment - 80% of patients received BRT alone, 20% received combined EBRT, BT and chth. 36 patients received 3 fractions of HDR during treatment up to total dose 22.5 Gy, 7.5 Gy per fraction, the rest – 2 x 7.5 Gy.

Results: 1. Median observation time was 5.4 months.2. Local response - Complete remission (CR) 2 (4%) cases, partial remission (PR) in 31 (62%) cases, lack of remission (NR) in 6 (12%) cases, progression in 11 cases (22%). Median survival time according to received remission was for CR – 7 months, for PR – 5,75 months, for NR – 1,25 months. 3.Influence of tumor location on patients treatment response - no significant correlations between these two parameters. 4. A longer median observation time was observed when tumor size was less than 5 cm (6.1 months), than in a group with tumor longer than 10 cm (4.9 months). 5. Histopathology no significant group whose response was better than the others 6. No any significant correlation between treatment modality, fractionation schedules and tumors response degree. 7. Overall complication rate was 22% with ulceration in 1 patients (2%), bleeding (2%) and tracheo-esophageal fistula in (18%). 8. Significant correlation between higher incidence of complication rates according to higher Zubrod status score was observed.

Conclusions: 1.Insertion of stent allowed in many cases use of HDR-BT.2. High-dose-rate brachytherapy connected with placement of self-expanding stents has a good, but a short-term palliative effect of diminishing dysphagia in patients with malignant esophageal strictures. 3. These two modalities of treatment achives good palliation with