

embolization and were sacrificed after follow-up angiogram on day 2 and 21 of embolization, respectively. Degradation of the GMP and pathological changes were evaluated. For *in vitro* study, each GMP was mixed with saline and placed in a 37°C thermostat. Macroscopic and microscopic morphological changes of GMPs were compared for 2 weeks. **Results:** Both high and low MW spherical GMPs showed effective embolic results. On 2-day follow-up angiography, vessels were slightly recanalized to a similar degree. However, in low MW group, embolized arteries were reperfused to a greater extent on day 21, compared to the high MW GMP. Histologically, perivascular inflammation and fibrosis were more frequently identified in high MW group. In *in vitro* study, low MW GMP lost the spherical shape and degraded on day 5 and was invisible on microscopy, whereas high MW GMP was only partially degraded after 2 weeks. **Conclusion:** Low MW fish-derived spherical GMP revealed short-term embolic effect and provided early recanalization of the occluded arteries with low inflammatory response.

OR4.7

Stimulant Antibiotic-Impregnated Beads for the Treatment of Diabetic Foot Infection and Vascular Graft Infection

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Objectives: Limited evidence has been found on the effectiveness of Stimulan antibiotic beads for the treatment of diabetic foot ulcer or vascular graft infection, and it is still yet to be explored. Our goal was to review the healing effect, the rate of infection eradication, the graft preservation, and the length of postoperative hospital stay in patients who acquired prosthetic graft infection and diabetic foot infection and hence compare the results of both. **Methods:** This was a retrospective review of patients implanted with Stimulan antibiotic beads at Northampton General Hospital in England from 2017 to 2019. A cohort of 22 patients aged between 45 and 92 was used in this study to compare the postoperative outcome of the wound and the duration of healing and follow-up. **Results:** Nineteen patients with diabetic foot infection and three patients with local vascular graft sepsis were treated with Stimulan antibiotic beads insertion. Grafts such as aorto-bifemoral bypass, femoral-to-femoral crossover, and femoral distal popliteal bypass were included. The average length of hospital stay for the patients with Stimulan beads insertion was 8 days. For healing effect, 82% of the patients (18 in 22 patients) had healed wounds within the first follow-up appointment, two patients had a partial healing effect which required further follow-up appointments, and two patients showed no signs of healing and needed re-admission. 9% of the main study group had a new onset of infection elsewhere. **Conclusion:** This study concluded the success of Stimulan antibiotic beads being used as the treatment of diabetic foot infection and local vascular graft sepsis, especially in patients with major vascular reconstruction. Stimulan antibiotic beads should be considered as one of the effective managements in treating vascular graft infection and diabetic foot infection.

OR4.8

Survival Benefit of Aggressive Treatment Approaches Incorporating Yttrium-90 Radioembolization for Late-Stage Hepatocellular Carcinoma

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Objectives: To evaluate treatment allocation and outcomes for Barcelona Clinic Liver Cancer (BCLC) stage C and D hepatocellular carcinoma (HCC) following our institution's multidisciplinary approach utilizing yttrium-90 radioembolization (Y90). **Methods:** All new HCC diagnoses discussed at our multidisciplinary tumor board, 2010–2013, were included. Charts were reviewed for demographics, tumor characteristics, laboratory values, treatment, and outcomes on an intention-to-treat basis (resection, transplant, ablation, Y90, transarterial chemoembolization, sorafenib, palliative therapy). Patients received a BCLC stage at initial treatment. Survival analyses were performed from first treatment date until death, loss to follow-up, or end of capture period (April 2, 2019). **Results:** Over 4 years, 321 treatment-naïve patients with HCC were enrolled, of which 33% were BCLC C and 15% were BCLC D. Between these two stages, the median age was 61 years with predominance of hepatitis C-associated disease (39%, 60). Median follow-up and median overall survival (mOS) were 13 and 15 months (95% confidence interval [CI] 18–88), respectively. Table 1 describes treatment groups and BCLC-discordance by stage. Y90 comprised 65% and 50% of BCLC-discordant treatments in BCLC C and D patients, respectively. BCLC-discordant patients had longer mOS in BCLC C (hazard ratio [HR] 0.27, 95% CI: 0.12–0.60, 25 vs. 4 months, $P = 0.001$) and D (HR 0.16, 95% CI: 0.06–0.39, 47 vs. 2 months, $P < 0.001$) groups. mOS of BCLC C and D patients bridged to curative therapy was 64 (43–81) and 72 (58–85) months, respectively. Actual mOS was longer in Y90 (43 vs. 32 months, $P < 0.001$) and transplant (61 vs. 16 months, $P < 0.001$) groups compared to expected mOS by BCLC stage. **Conclusion:** This analysis of a large cohort of untreated HCC demonstrates significant survival benefit in BCLC C and D patients when incorporating Y90 in the treatment algorithm, supporting more aggressive locoregional therapies that limit disease progression.

OR4.9

Prostatic Artery Embolization for the Treatment of Chronic Bacterial Prostatitis: An Early Experience in Four Cases with 1-Year Follow-Up

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Objectives: Chronic bacterial prostatitis (CBP) is a common health problem affecting about 10% of males, characterized by recurrent episodes of urinary tract infections with devastating

pelvic pain, urinary symptoms, and ejaculatory pain. It is diagnosed by semen, urine, or prostatic secretions cultures. Classic treatments usually focus on symptomatic relief with 4–6 weeks repeated courses of fluoroquinolones and anti-inflammatory agents; however, more than 50% of these patients experience repeated recurrence of infection and worsening symptoms. Our study aims at assessing early results of prostatic artery embolization (PAE) in four patients with recurring CBP. **Methods:** From March to December 2018, four cases with CBP diagnosed by semen cultures all presenting with recurring symptoms and infection for 4 times per year or more, with mean prostatic volume of 42 cc, were referred to us by urologists for PAE. Patients were consented it is a clinical trial. All patients received a 4 weeks preprocedural course of fluoroquinolone or nitroferuntoin according to culture then stoppage for a week then repeating the culture. On a negative culture basis, bilateral PAE was done with 100–300 μ spherical particles. **Results:** Bilateral PAE was feasible in the 4 patients with complete disappearance of prostatic blush and pruned prostatic artery as angiographic endpoint. No major complications occurred. Postoperative dysuria and urgency took place for a week. Prostate size decreased to a mean of 33 cc 1 year after embolization. Three patients reported marked subjective improvement of urinary symptoms; none of them needed further cultures for 1 year. One patient had recurring symptoms 7 months after embolization despite decrease in prostate size and was treated by regular measures. **Conclusion:** In our very small series, PAE has shown a potential role in the treatment of CBP; further studies are needed on larger number of patients are needed for proper procedure assessment.

OR4.10

Image-Guided Percutaneous Sclerotherapy of Orbital Low-Flow Vascular Malformations

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Objectives: To evaluate the effectiveness and safety of percutaneous sclerotherapy using bleomycin for orbital low flow vascular malformations. **Methods:** Between October 2015 and August 2019, we prospectively evaluated 24 patients who clinically and radiologically diagnosed with orbital low-flow vascular malformations. Sixteen females and eight males were included in the study, ranging in age from 3 to 46 years (mean: 13.4 ± 10.3). Twenty-two patients presented with proptosis and limited ocular motility, 15 patients with dystopia, and 2 patients with amblyopia and exposure keratitis. Ophthalmological assessment, ultrasound, and magnetic resonance imaging were performed before and 6 weeks after treatment. Under general anesthesia, orbital lesions were punctured guided by ultrasound, fluoroscopy, and cone-beam computed tomography. Before sclerotherapy, small volume of Omnipaque was injected to exclude vascular communication or contrast leakage, and then bleomycin was instilled. Procedures were repeated at 8-week intervals, depending on clinical and radiological response. The follow-up period ranged from 3 to 40 months, with a mean: 19.5 ± 12.4 . **Results:** Fifteen patients were diagnosed with lymphatic malformations, and nine patients with venous malformations. Forty-one sclerotherapy sessions were performed (range: 1–3,

mean: 1.7 ± 0.8). Bleomycin dose ranged 2–20 IU (mean 7.2 ± 4.6). Clinically, there was a significant reduction in the degree of proptosis ($P = 0.001$) and dystopia ($P = 0.002$), with no significant changes in the visual acuity. Radiologically, there was significant reduction in the maximum lesions diameters and volumes ($P = 0.001$ and $P = 0.005$, respectively). Transient pain, edema, and ecchymosis occurred following the procedure with no major complications encountered. **Conclusion:** Intralesional bleomycin therapy could be a safe and effective treatment for orbital low-flow vascular malformations with low rate of complications.

OR4.11

Dosimetry of Vascular and Interventional Radiology Procedures: Five-Year Analysis in a Tertiary Care Institution in Saudi Arabia

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Objectives: To evaluate the dosimetry of vascular and interventional radiology (IR) procedures at a single tertiary care institution and compare it to the previously reported international diagnostic reference levels. **Methods:** This was a retrospective review of the radiation doses recorded by the dose management software (DoseWatch™) for all vascular and interventional procedures done between January 2015 and December 2018 at King Abdulaziz Medical City, Riyadh, Saudi Arabia. Pediatric procedures were excluded from the current analysis. The height, weight, age (>14 years), sex, reference dose point air kerma (mGy), dose area product (DAP) ($\text{Gy}\cdot\text{cm}^2$), and fluoroscopy time (s) were collected, and the body mass index (BMI) was calculated. Categorical data are presented as percent frequencies. Continuous variables are presented as mean, median, standard deviation, 25th and 75th percentile, and ranges. Two independent sample *t*-test was used to compare our study mean values with RAD-IR study and CIRD study. Person's correlation was performed to assess for the correlation between the study variables. Statistical significance was defined as $P < 0.05$. SAS Version 9.4 (Cary, NC, USA) was used for all the analyses. Graphic representations were created using spreadsheet software (Excel 2017; Microsoft, Redmond, Washington, USA). **Results:** Data of 3444 procedures in 2333 adults were recorded. The study included 1935 male patients (56.18%) and 1509 female patients (43.82%) with a mean age of 56.6 (15–117 years). Analysis of 22 different IR procedures was done. Peripherally inserted central catheter placement was the most commonly performed procedure ($n = 1045$, 30.3%) followed by tunneled catheter placement ($n = 784$, 22.76%), gastrostomy ($n = 392$, 11.4%), and percutaneous transhepatic cholangiography ($n = 205$, 5.95%). Trans jugular intrahepatic portosystemic shunt (TIPSS) creation had the highest mean fluoroscopy time (78.65 min) followed by uterine fibroid embolization (33.47 min), TIPSS revision (31.79 min), and varicocele embolization (31.75 min). TIPSS creation had the highest mean DAP ($1649.35 \text{ Gy}\cdot\text{cm}^2$) followed by hepatic chemoembolization ($588.64 \text{ Gy}\cdot\text{cm}^2$), hepatic artery mapping ($573.75 \text{ Gy}\cdot\text{cm}^2$), and TIPSS revision ($539.12 \text{ Gy}\cdot\text{cm}^2$). TIPSS creation was associated with the highest mean reference dose (6.72 Gy), followed by hepatic chemoembolization (3.18 Gy), hepatic artery mapping (2.44 Gy), and embolization (2.24 Gy). Compared to a recent and the RAD-IR studies, TIPSS creation and transarterial chemoembolization are