

Barcelona, Spain
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PART 1

**Abstracts of
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sorted by presentation
numbers**

In the no endovascular intervention group all patients needed transfusion and one had hysterectomy. The length of hospital stay was 4 days. **Conclusion:** PBOIIA was associated with an acceptable foetal radiation dose, which is below the specific threshold level for deterministic effect. It was safe and effective with the blood loss volume effectively controlled.

P-766

Effective dose management using digital subtraction fluoroscopy save (DSFS) technique for extremity angiography

S. Kim¹, I. Ko¹, K. Yeon²

¹Interventional Radiology, Samsung Medical Center, Seoul, KR,

²Radiology, Samsung Medical Center, Seoul, KR

Purpose: Proper use of the "fluoroscopy save," option allows for the DSFS (digital subtraction fluoroscopy save) to be substituted for cases requiring hand injection DSA (digital subtraction angiography) images. **Material and methods:** To best replicate a real clinical situation where a dye is injected into the patient, Phantom and vessel models were used. A polyvinyl chloride tube was curved to represent the vessel, which was placed inside an acrylic box (3mm) with an entry and an exit site for the dye. The Phantom was placed above the box to commence the experiment. The device model used was 'Allular X-per FD-20,' with the table height set at 85cm, SID 100, and FD size 48. The glass dosimeter was attached at 2 points: surface of the phantom for surface dose and the location of the operator for neighboring dose, with the detector 1cm away. An auto-injector was used to administer 20mL of the dye at 1mL/sec, with the image acquired through both DSA and DSFS.

Results: On average, 79.19% of the surface dose was reduced from 4122.67µGy to 857µGy, the neighboring dose from 117µGy to 23.67µGy at 79.75%. Independent t-test was completed through SPSS (version 18; PASW statistics), with the analysis showing significant difference ($p < 0.001$).

Conclusion: Compared to the DSA, DSFS allows image acquisition with 79% reduced radiation dose, and a higher frame rate useful for capturing branching of the vessels. Furthermore, DSA road map can be used in conjunction with DSFS, further reduction in radiation would be possible without compromise of patients' health.

P-767

Percutaneous embolization of recurrent varicocele in pediatric population: patient dose exposure analysis

M. Graziano, F. Siviero, A. Vizzuso, F. Ermili, S. Dall'ara, Z. Ferrante, E. Salviato, R. Galeotti

Morphology, Surgery and Experimental Medicine, University of Ferrara - Saint'Hanna Hospital, Cona, IT

Purpose: Spermatic vein embolization represent an effective and minimally invasive option for varicocele. In pediatric population it is currently reserved for surgical relapse. Aim of this work is to prove that the varicocele endovascular treatment in pediatric patients entails low rate of complications and recurrences with a low ionizing radiation exposure.

Material and methods: A consecutive retrospective series of 47 adolescent patients treated with endovascular retrograde embolization after post-surgical recurrence was collected. Images were acquired according to a strict protocol of low dose radioscopy. Dose area product (DAP) was recorded for each procedure. We estimated with Monte-Carlo Simulator by our Health Physics Unit the Effective dose (E) and malignancy risk.

Results: Results were as follows: therapeutic success in 46/47 patients (98%) with complete resolution in 41/46 (89%) and degree reduction in 5/46 (11%). No significant complications occurred. Average DAP was equal to 18881 mGyxc²; average DAP was equal to 13208 mGyxc² after the introduction of flat panel (2013). Average E equal to 1,6 mSv and a risk of malignancy equal to $8,7 \times 10^{-5}$.

Conclusion: Percutaneous embolization of varicocele appears to be effective as surgical correction. Pediatric patients undergoing this treatment have very low values of ionizing radiation exposure with an equally low

risk of malignancy. New technological devices combined with a greater experience of the operators can further reduce the dose administered to these young patient.

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Phantom study of real-time eye lens dose rate monitoring with a scintillator with optical fiber dosimeter

Y. Sakuhara¹, T. Takata², M. Ishikawa³, J. Kotoku², H. Kondo⁴

¹Diagnostic and Interventional Radiology, Tonan Hospital, Sapporo, JP,

²Graduate School of Medical Care and Technology, Teikyo University,

Itabashi-ku, JP, ³Graduate School of Health Sciences, Hokkaido

University, Sapporo, JP, ⁴Radiology, Teikyo University School of Medicine, Tokyo, JP

Purpose: To evaluate real-time monitoring of the eye lens dose rate during fluoroscopy measured with a scintillator with optical fiber (SOF) dosimeter.

Material and methods: Posteroanterior (PA), right anterior oblique 30 (RAO30) and left anterior oblique 30 (LAO30) fluoroscopies (10 seconds exposure, 2.5 f/s) were performed at the phantom patient's chest and upper abdomen with a physician phantom positioned at the right thigh. Physician's left eye lens dose rate (µGy/s) was recorded with a SOF dosimeter (MIDSOF, Acrobio Co., Japan) with and without a suspended transparent leaded shield (2 mm lead equivalent) and leaded table skirt (0.5 mm lead equivalent). The median dose rate and interquartile range (IQR) of 10 times fluoroscopies in each condition were analyzed. Reduction factors of the dose rate were compared with the unshielded condition.

Results: The medians of eye lens dose rate without protection implements were 27.8 (IQR: 24.9-36.1), 32.4 (24.7-39.0) and 33.6 (29.8-43.6) µGy/s in PA, RAO30 and LAO30, respectively. The medians with a suspended shield were 19.6 (17.3-24.4), 23.5 (19.2-28.9) and 21.5 (19.1-27.7) µGy/s, respectively. The medians with a skirt were 17.6 (16.0-22.3), 19.8 (17.8-26.2) and 19.7 (13.0-27.3) µGy/s, respectively. The medians with both protection implements were 12.2 (10.7-15.7), 12.8 (10.6-15.9) and 12.0 (10.1-15.2) µGy/s, respectively. Use of a suspended shield or skirt alone significantly reduced the lens dose rate ($p < 0.001$). Use of both implements together was more protective than either used alone ($p < 0.001$).

Conclusion: Use of a suspended transparent leaded shield or/and leaded table skirt significantly decreases physician's eye lens dose rate.

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Radiation exposure in 250 patients in a single high-volume center for prostatic artery embolization (PAE)

M. Zeile¹, R.M. Wentz¹, P. Steffen¹, D. Rothfuchs¹, C.R. Habermann²

¹Institute of Diagnostic and Interventional Radiology, Kath.

Marienkrankehaus, Hamburg, DE, ²Diagnostic and Interventional Radiology, Kath. Marienkrankenhaus GmbH, Hamburg, DE

Purpose: In published studies, radiation exposure (RE) in PAE to the patient may reach critical levels as in the study of Andrade (JVIR 2017) with mean dose are products (DAP) of 45.070 cGy² and a maximum exposure of 79.173 cGy² in a single patient. The aim of this study was to assess the impact of experience on RE in this demanding procedure in a high-volume center (HVC).

Material and methods: Between January 2017 and September 2018, 250 consecutive patients with lower urinary tract symptoms (LUTS) secondary to benign prostate hyperplasia (BPH) were treated by intended bilateral PAE. For each patient, age, body mass index (BMI), Dose area product (DAP), fluoroscopy time (FT) were recorded. Examinations performed in 2017 (N = 121, Group A) were compared to the ones of 2018 (N = 129; Group B). A comparison to the literature was amended.

Results: All patients were male, mean age was 70.9 ± 8.6 years. Mean BMI measured 26.8 ± 3.6. Regarding patient related parameters, there were no differences between Groups A and B ($p > 0.05$). Looking at procedure parameters, mean FT of all patients was 52.1 ± 23.8 mins. Mean DAP amounted for 10.515 ± 4.970 cGy². There was no difference observed