

قال تعالى

﴿بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ﴾

﴿يَهْبُ لِمَنْ يَشَاءُ إِنَّا نَا وَیَهْبُ لِمَنْ يَشَاءُ﴾  
الذُّكُورَ (49) أَوْ يُزَوِّجُهُمْ ذُكْرَانًا وَإِنَّا نَا  
وَيَجْعَلُ مَنْ يَشَاءُ عَقِيمًا إِنَّهُ عَلِيمٌ قَدِيرٌ )

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# **Dedication**

To my parents

To My wife

To my friends

To all my family

I dedicate this work and I hope ALLA (The God) please you all.

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# Abstract

A varicocele is an abnormal dilation of the pampiniform plexus of the testicular veins, which drain the testicle. It can be treated surgically or by percutaneous catheter embolization. It is essential that the radiation risks associated with the procedure are minimized.

The objectives of this study are to: Evaluate the value of the varicocele catheter embolization versus the microsurgical varicocelectomy impacted on semen analysis, evaluate the feasibility of the methods of treatment of varicocele, estimate the radiation risks in the varicocele catheter embolization and finally optimize the radiation dose to patients during the varicocele catheter embolization procedures.

A total of one hundred and nineteen patients aged (mean age 35.56 years) referred to the division of andrology, were diagnosed with varicocele. Patients were divided into two groups according to the method of treatment: Group (A) 66 patients treated by varicocele catheter embolization (15 prospective and 51 retrospective) and group (B) 53 patients treated by microsurgical varicocelectomy.

Infertility was the indication for treatment in both groups. Semen analysis was performed for both groups three times before treatment and at least three times after treatment, with 3-days abstinence from sexual intercourse before semen collection. A minimum interval between all the analyses was 2 weeks. The success rate, recurrence rate and complication were recorded for group (A) and group (B). Radiation doses were recorded prospectively and retrospectively for group

(A). Dose area product DAP during varicocele embolization were measured; these results were then used to estimate the effective dose which used to estimate the fatal cancer risk.

In Group (A) a 15 consecutive patients attending for varicocele embolization were optimized prospectively by reducing fluoroscopy time, tube current, beam collimation, number of images in fluorography and number of exposures in radiography. \_

The mean value of the total DAP during fluoroscopy, effective dose, estimated fatal cancer were (18.32 Gy.m<sup>2</sup> and 29.79 Gy.m<sup>2</sup>), (5.32 mSv and 8.64 mSv) and ( $292.4 \times 10^{-6}$  and  $478.1 \times 10^{-6}$ ) for the prospective and retrospective series respectively. The mean value of X-ray tube voltage for fluoroscopy, mean value of X-ray tube voltage for radiography, mean value of tube current for fluoroscopy and mean value of tube current for radiography were (78.5 kV and 75.4 kV), (75.8 kV and 76.14 kV), (4.7 mA and 5.3 mA) and (545 mA and 556.05 mA) for prospective and retrospective series respectively.

Correction of varicocele improves semen quality regardless the method of treatment. Varicocele embolization may be the preferred approach compared with surgery in men with unilateral left-sided varicoceles as this approach offers many benefits in terms of patient safety, morbidity, high success rate with low recurrence rate, effective, minimally invasive and economically viable technique that can be performed on an outpatient basis. Due to radiation protection, this procedure should be performed using fluoroscopy only and limiting exposure time. With careful attention to the technique, substantial reduction in radiation dose can be achieved.

## الملخص

دوالي الخصيتين هي تضخم غير طبيعي للشبكة الوريدية المحيطة بالخصية، والتي يمكن علاجها بالجراحة أو بواسطة القسطرة لإغلاق الوريد الخصوي. من المهم تقليل خطر الإشعاع الناتج من جرعة الأشعة التي يتعرض لها المريض خلال هذه العملية.

الأهداف الرئيسية لهذه الدراسة هي: تقييم العلاج الجراحة مقابل العلاج بالقسطرة استناداً إلى نتائج فحص السائل المنوي، تقييم جدوى علاج دوالي الخصيتين في زيادة الخصوبة، تقدير الخطر الناجم عن التعرض للأشعة خلال هذه العملية و أخيراً تقييم الجرعة الإشعاعية التي يتعرض لها المريض خلال عملية القسطرة.

تم رصد 119 مريض متوسط أعمارهم 35.56 سنة و الذين حضروا لعيادة الذكورة و العقم و تم تشخيصهم بدوالي الخصيتين. تم فحص السائل المنوي لهم قبل العلاج و بعد العلاج. و تم تقسيمهم إلى مجموعتين حسب نوع العلاج: المجموعة (أ) تتكون من 66 مريض تم علاجهم بواسطة القسطرة (15 تم عملهم و 51 تم مراجعة بياناتهم من ملفاتهم فقط) و المجموعة (ب) و تتكون من 53 مريض تم علاجهم بالجراحة. العقم كان السبب الرئيسي للعلاج بالمجموعتين. تم عمل تحليل للسائل المنوي للمجموعتين ثلاث مرات قبل العلاج و ثلاثة مرات بعد العلاج علي الأقل. يؤخذ السائل المنوي بعد غياب ثلاثة أيام عن الممارسة الجنسية. أقل فترة بين التحاليل هي اسبوعين. تم تسجيل معدلات النجاح للطريقتين و كذلك معدل التكرار للطريقتين و المضاعفات. تم تسجيل جرعات الأشعة في المجموعة (أ) للحالات التي تم عملها و الحالات المسجلة من الملفات. تم تسجيل الجرعة الناتجة في المساحة (DAP) أثناء العلاج بالقسطرة و تم استخدام هذه القراءة في تحديد الجرعة الفعالة و التي من خلالها تم تقدير خطر السرطان القاتل. متوسط قيمة الجرعة الناتجة في المساحة (DAP) أثناء الأشعة المرئية، الجرعة الفعالة و خطر الإصابة بالسرطان المقدّر كان (5.32 mSv and 8.64 mSv 18.32), ( $5.32 \text{ mSv and } 8.64 \text{ mSv } 18.32$ ) و ( $\text{Gy.m}^2$  and  $29.79 \text{ Gy.m}^2$ ) و

478.1×10<sup>-6</sup> 6-10×292.4 and) للحلات التي تم عملها و الحالات المسجلة بالترتيب. متوسط قيمة فرق الجهد في الاشعة المرئية , و متوسط قيمة فرق الجهد في الاشعة العادية, متوسط تيار الانبوب في الاشعة المرئية و متوسط تيار الانبوب في الاشعة العادية كان (78.5 kV and 75.4 kV) ((75.8 kV and 76.14 kV (mA and 5.3 mA 4.7) و (mA and 556.05 mA 545) للحلات التي تم عملها و الحالات المسجلة بالترتيب.

علاج دوالي الخصيتين يؤدي الي تحسين السائل المنوي بغض النظر عن الطريقة التي تم بها العلاج. العلاج بالقسطرة قد يكون مفضلا علي العلاج بالجراحة في المرضى الذين يعانون من دوالي الخصية اليسرى فقط, هذه الطريقة توفر فوائد جمة من ناحية سلامة المريض و تقليل زمن الاستشفاء و معدلات النجاح العالية و وانخفاض معدلات التكرار مرة اخرى و الفعالية و قلة الخطورة و جدواها الاقتصادية حيث انها علاج يمكن عمله من غير تنويم للمريض بالمستشفى. من ناحية الوقاية من الاشعاع, هذه العملية يجب ان تتم بالاشعة المرئية فقط, و العمل علي تقليل زمن التعريض. مع زيادة الاهتمام بطريقة عمل القسطرة يمكن ان يحدث انخفاض ملحوظ في جرعة الاشعة التي يتعرض لها المريض.