شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

HANAA ALY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

Role of Autologous Platelet Rich Plasma (PRP) in Hypospadias Repair

Thesis Submitted for partial fulfillments of the requirements of MD Degree in Pediatric Surgery

By:

Ahmed Sobh Ahmed Darwish

M.B.B.CH 2010, Faculty of Medicine, Suez Canal University

Master of surgery 2016

Supervisors

Prof. Dr. Osama Abdulallah Elnaggar

Professor of Paediatric surgery
Paediatric surgery, Faculty of Medicine, ASU

Prof. Dr. Amr Abd-Elhameed Zaki

Professor of Paediatric Surgery
Faculty of Medicine, Ain Shams University

Associate Prof. Karam El-sayem Ahmed

Associate Professor of Paediatric Surgery
Faculty of Medicine, Suez Canal University

Associate Prof. Noha Mohamed Kamel

Associate Professor of Clinical Pathology
Faculty of Medicine, Suez Canal University

Associate Prof. Mohamed Mousa Dahab

Associate Professor of Paediatric Surgery
Faculty of Medicine, Ain Shams University

Faculty of Medicine
Ain Shams University
2020

ACKNOWLEDGMENTS

First and Foremost, praise is to **Allah** for giving me the opportunity, the determination and the strength to do this work. Without his blessings, this achievement would not have been possible.

I would like to express my deepest gratitude to**Prof. Dr. Osama Abdulallah Elnaggar**Professor of Pediatric surger, Faculty of Medicine, ASU; for his meticulous supervision, kind guidance, and valuable instructions through this work.

I'm also deeply grateful to**Assist. Prof. Amr Abd-Elhameed Zaki,**Assistant Professor of Pediatric SurgeryFaculty of Medicine, Ain Shams University; for his sincere efforts, fruitful encouragement and sincere guidance that helped me much in the accomplishment of this work.

I turn with a grateful heart to **Assist. Prof. Karam El-sayem Ahmed**Assistant Professor of Pediatric SurgeryFaculty of Medicine, Suez Canal University**.**I am indebted to his meticulous supervision, constructive criticism, expertise, and continuous unlimited help.

I wish to express my appreciation to**Assist. Prof. Noha Mohamed Kamel**Assistant Professor of Clinical PathologyFaculty of Medicine, Suez Canal University for her meticulous supervision, valuable support and instructions throughout this thesis.

Many thanks to **Dr. Mohamed Mousa Dahab** Lecturer of Pediatric SurgeryPediatric surgery, Faculty of Medicine, Ain Shams University**.** It was his enthusiasm and kind attitude that made the easiest out of the most difficult.

Finally, I would like to dedicate this work for my beloved family; for their love, endless support and sacrifices.

Ahmed Sobh Ahmed Darwish

ACKNOWLEDGMENTS

First and Foremost, praise is to **Allah** for giving me the opportunity, the determination and the strength to do this work. Without his blessings, this achievement would not have been possible.

I would like to express my deepest gratitude to**Prof. Dr. Osama Abdulallah Elnaggar**Professor of Pediatric surger, Faculty of Medicine, ASU; for his meticulous supervision, kind guidance, and valuable instructions through this work.

I'm also deeply grateful to**Assist. Prof. Amr Abd-Elhameed Zaki,**Assistant Professor of Pediatric SurgeryFaculty of Medicine, Ain Shams University; for his sincere efforts, fruitful encouragement and sincere guidance that helped me much in the accomplishment of this work.

I turn with a grateful heart to **Assist. Prof. Karam El-sayem Ahmed**Assistant Professor of Pediatric SurgeryFaculty of Medicine, Suez Canal University**.**I am indebted to his meticulous supervision, constructive criticism, expertise, and continuous unlimited help.

I wish to express my appreciation to**Assist. Prof. Noha Mohamed Kamel**Assistant Professor of Clinical PathologyFaculty of Medicine, Suez Canal University for her meticulous supervision, valuable support and instructions throughout this thesis.

Many thanks to **Dr. Mohamed Mousa Dahab** Lecturer of Pediatric SurgeryPediatric surgery, Faculty of Medicine, Ain Shams University**.** It was his enthusiasm and kind attitude that made the easiest out of the most difficult.

Finally, I would like to dedicate this work for my beloved family; for their love, endless support and sacrifices.

Ahmed Sobh Ahmed Darwish

Contents

LIST OF TABLES

LIST OF FIGURES

Introduction & Rational

INTRODUCTION

Platelet-rich plasma (PRP) is a concentrate of platelet-rich plasma protein derived from whole blood, centrifuged to remove red blood cells. It has a greater concentration of growth factors than whole blood, and has been used to encourage a brisk healing response across several specialties, in particular dentistry, orthopedics and dermatology **(Smith, 2016).**

As a concentrated source of blood plasma and autologous conditioned plasma, PRP contains several different growth factors and other cytokines that can stimulate healing of soft tissue and joints. Main indication in sports medicine and orthopedics are acute muscle strains, tendinopathy and muscle-fascial injuries and osteoarthritis **(Smith, 2016).**

PRP was first developed in the 1970s and first used in Italy in 1987 in an open heart surgery procedure. PRP therapy began gaining popularity in the mid-1990s. Ever since, it has been applied to many different medical fields such as cosmetic surgery, dentistry, sports medicine and pain management **(Borrion et al., 2010).**

The efficacy of certain growth factors in healing various injuries and the concentrations of these growth factors found within PRP are the theoretical basis for the use of PRP in tissue repair **(Borrion et al., 2010).**

In humans, the typical baseline blood platelet count is approximately 200,000 per μL; therapeutic PRP concentrates the platelets by roughly five-fold. There is broad variability in the production of PRP by various concentrating equipment and techniques **(Rasmusson et al., 2009).**

PRP has been investigated and used as a clinical tool for several types of medical treatments, including chronic tendinitis, osteoarthritis, for bone repair and regeneration, in oral surgery, and in plastic surgery **(Por et al., 2009).**

Since 2004, proponents of PRP therapy have argued that negative clinical results are associated with poor-quality PRP produced by inadequate single spin devices. The fact that most gathering devices capture a percentage of a given thrombocyte count could bias results, because of inter-individual variability in the platelet concentration of human plasma and more would not necessarily be better **(Marx, 2004).**

In 2009, a systematic review of the scientific literature found there were few randomized controlled trials that adequately evaluated the safety and efficacy of PRP treatments and concluded that PRP was "a promising, but not proven, treatment option for joint, tendon, ligament, and muscle injuries" **(Foster et al., 2009).**

Recently in 2016, a systematic review and meta-analysis of randomized controlled clinical trials for PRP use to augment bone graft found only one study reporting a significant difference in bone augmentation, while four studies found no significant difference **(Pocaterra et al., 2016).**

The variability in platelet concentrating techniques may alter platelet degranulation characteristics that could affect clinical outcomes **(Yu et al., 2011).** In the field of aesthetics and plastic surgery, the clinical application is particularly wide and is under the name of Regenerative Plastic Surgery. PRP associated with adipose tissue, is given for breast reconstruction, facial soft tissues defects, and lower extremity ulcers and scars **(Methap Pasin et al, 2014).**

There are no studies to date that have reliably documented adverse effects associated with PRP treatment, possibly due to poor and inconsistent methodology **(Frautschi et al., 2017).**

In the beginning of the 21st century, the PRP has been thought of as a healing promoter in many fields and in treatment of many diseases. Hypospadias is one example of these disorders. Hypospadiasis the second most common congenital anomaly in newborn males. It occurs as a result of displacement of the urethral opening alongside the penis. The prevalence of hypospadias is estimated to be 11.3 of 10000 to affect less than 0.1% of newborns worldwide **(Fernandez et al., 2016).**

Many procedures have been tried for the sake of proper management of hypospadias. The aim of hypospadias repair surgeries is to construct a penis with normal shape and function. Over hundreds of procedures have been applied in a trial to achieve this aim. Of them all, tubularized incised plate (TIP) is the most convenient technique, which became the most common procedure for hypospadias repair (**Snodgrass et al., 2010).**

During all these procedures, multiple complications take place. These complications include infection, edema, phimosis, meatal stenosis, bleeding and hematoma. Thus, a new perspective has been developed searching for a natural product with the minimum complications **(Lana et al.,2014).**

Given its high success rate and excellent healing abilities, autologous PRP preparations have been used to offer a supporting layer for urethral repair. Nevertheless, there are few studies which investigated the efficacy of autologous PRP preparation in hypospadias repair. That is why this study aimed at assessment of the role of autologous PRP in hypospadias repair, its effectiveness and associated morbidity.

Aim & objectives