

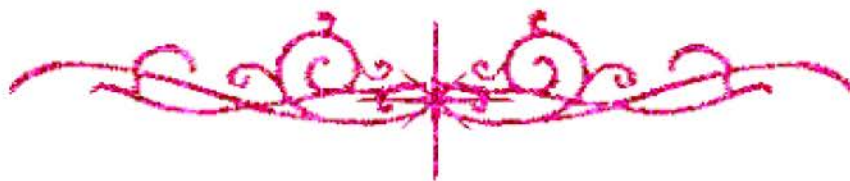
بسم الله الرحمن الرحيم





شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم



جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

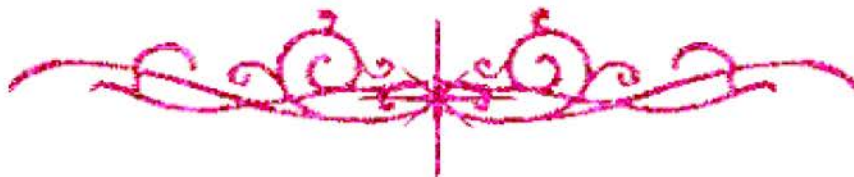
قسم

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



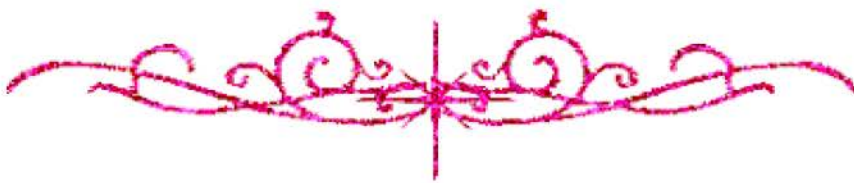
يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



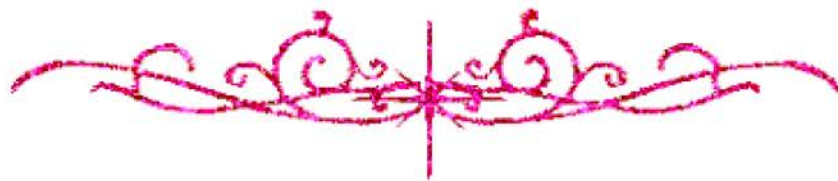


بعض الوثائق الأصلية تالفة





بالرسالة صفحات
لم ترد بالأصل



B 12770

**Cairo University
Faculty of Physical Therapy
Department of Biomechanics**

**EFFECT OF USING SELECTED FOOT ORTHOSES
ON FOOT PRESSURE DISTRIBUTION IN
PATIENTS WITH HALLUX VALGUS**

By
Radwa Eid Sweif
B.Sc. in Physical Therapy, Cairo University, 1999

Thesis
Submitted in Partial Fulfillment of the Requirements for Master Degree in
Physical Therapy

2005

Supervisors

Prof. Dr. Mohamed Fouad Ibrahim Khalil

Professor and Chairman of the Department of Biomechanics
Faculty of Physical Therapy
Cairo University

Mohamed Fouad Ibrahim Khalil

Dr. Salam Mohamed Elhafez

Lecturer of Biomechanics
Faculty of Physical Therapy
Cairo University

Salam Mohamed Elhafez

Dr. Nagui Sobhi Nassif

Lecturer of Biomechanics
Faculty of Physical Therapy
Cairo University

Nagui Sobhi Nassif

بسم الله الرحمن الرحيم

وقل رب زدني علما

سورة طه - الآية ١١٤

First of All

Thanks To ALLAH

The Most

Compassionate and

Most Merciful

who enabled me to

conduct this work

Acknowledgement

I would like to thank ***Prof. Dr. Mohamed Fouad Ibrahim Khalil***, Professor and Chairman of the Biomechanics Department, Faculty of Physical Therapy, Cairo University for his real support and valuable comments, recommendations which was one of the important reasons to fulfill this study.

I would like to express also my special appreciation to ***Dr. Salam Mohamed Elhafez***, Lecturer of Biomechanics, Faculty of Physical Therapy, Cairo University for her sincere support and guidance in the practical aspect of the study and her helpful supervision to complete the research and achieve the best possible results of the study.

My deep gratitude, respect and appreciation to ***Dr. Nagui Sobhi Nassif***, Lecturer of Biomechanics, Faculty of Physical Therapy , Cairo University for his valuable comments and co-operation in the practical aspect of the study and his efforts to fulfill the study.

My special appreciation to ***Dr. Ghada Mohamed Elhafez***, Lecturer of Biomechanics, Faculty of Physical Therapy, Cairo University for the encouragement, the time reserved and important advises to conclude the study in a most practical way.

My best regards and thanks for all members of my small Family at the department of Biomechanics, Faculty of Physical Therapy Cairo University for their real assistance and support to prepare of this study.

Finally, I would like to thank the following people; my husband for being patient, giving me great deal of time and help to finalize this work. My mother for her kind support, encouragement and the time reserved to help me.

Effect of Using Selected Foot Orthoses on Foot Pressure Distribution in Patients with Hallux Valgus/ Radwa Eid Sweif: Cairo University, Faculty of Physical Therapy. Supervisors: Prof. Dr. Mohamed Fouad Ibrahim Khalil, Dr. Salam Mohamed Elhafez, Dr. Nagui Sobhi Nassif. Thesis: M.Sc.; Biomechanics, 2005.

Abstract

This study aimed to investigate the changes of foot pressure distribution under normal foot and Hallux Valgus (HV) foot. Also this study was conducted to investigate the best type of orthoses prescribed for HV patients from biomechanical point of view. The study was conducted on 30 normal subjects and 30 HV patients. Measuring average force and maximum pressure under the foot, using "Foot Scan" instrument. The HV group walked on the platform four times; first walking bare footed, second walking with wearing the first type of orthoses (separator), third wearing the second type of orthoses (bunion comforter) and fourth wearing both types of orthoses together. Comparisons done between the five different foot situations using ANOVA revealed that there was significant differences between pressure distribution of normal foot and HV foot. It is concluded that there is a change in pressure distribution in HV patient during walking when using the selected foot orthoses. Using separator orthosis may enable HV patient to walk as normally as in normal subjects.

Keywords: Foot Orthoses, Pressure Distribution, Hallux Valgus.

Contents

	Page
List of Abbreviations.....	iii
List of Tables.....	iv
List of Figures.....	v
Definitions of Terms.....	viii
 Chapter I: Introduction	 1
Statement of the problem.....	4
Purpose of the study.....	5
Significance of the study.....	5
Delimitation.....	5
Basic assumptions.....	6
Hypotheses.....	6
 Chapter II: Literature Review	 7
Functional anatomy and pathomechanics of Hallux Valgus	7
Evaluation of hallux valgus.....	26
Incidence and causes of HV.....	30
Clinical classifications and stages of HV.....	32
Plantar pressure in normal foot.....	38
Plantar pressure measuring devices.....	39
The relation between plantar pressure and HV.....	43
 Chapter III: Materials and Methods	 51

Criteria for subject's selection.....	51
1. Instrumentation.....	52
2. Procedures	55
1) Subject preparation.....	55
2) Instrument preparation.....	56
3) Technique of measurement.....	61
Chapter IV: Results.....	64
1. Results of the average force under the big toe.....	64
2. Results of the average force under the small toe.....	67
3. Results of maximum pressure under the big toe.....	70
4. Results of maximum pressure under the small toe.....	73
5. Results of the correlation between the big toe and the small toe for average force in all the studied situations.....	76
6. Results of the correlation between the big toe and the small toe for maximum pressure in all studied situations.....	80
7. Results of the average force under the forefoot.....	83
A. Lateral forefoot (LFF).....	83
B. Medial forefoot (MFF).....	86
C. Central forefoot (CFF).....	89
8. Results of maximum pressure under the forefoot	91
A. Lateral forefoot (LFF).....	91
B. Medial forefoot (MFF).....	94
C. Central forefoot (CFF).....	96
9. Results of the average force under the midfoot.....	98
10. Results of maximum pressure under the midfoot.....	100
11. Results of the average force under the heel.....	101
12. Results of maximum pressure under the heel.....	103

13. Comparison between the average force under the heel and big toe.....	105
14. Comparison between the maximum pressure under the heel and big toe.....	106
15. Comparison between the average force under the heel and small toe.....	107
16. Comparison between maximum pressure under the heel and small toe.....	108
17. Comparison between the average force under the heel and the lateral forefoot (LFF).....	109
18. Comparison between maximum pressure under the heel and the lateral forefoot.....	110
19. Comparison between the average force under the heel and the medial forefoot (MFF).....	111
20. Comparison between maximum pressure under the heel and the medial forefoot.....	112
21. Comparison between the average force under the heel and the central forefoot (CFF).....	113
22. Comparison between maximum pressure under the heel and the central forefoot.....	114
Chapter V: Discussion.....	115
Chapter VI: Summary and Conclusion.....	126
Recommendations.....	129
References.....	130
Appendix I.....	138
Appendix II.....	139
Arabic Summery.....	--