

# **RECENT BIOLOGICAL AND THERAPEUTIC ADVANCES IN MULTIPLE MYELOMA**

Essay

Submitted for the partial fulfil of

**MASTER DEGREE IN  
RADIATION ONCOLOGY AND NUCLEAR MEDICINE**

BY

**Dr . Ahmed Abdel fattah Refaee**

SUPERVISORS

**Prof . DR. SALWA MASSOUD IBRAHIM**

*Prof. of radiation Oncology & Nuclear Medicine  
Faculty of Medicine - Ain Shams University*

**DR . SOHAIR SAYED ISMAIL**

*Ass. Prof. of Radiation Oncology & Nuclear Medicine  
Faculty of Medicine - Ain Shams University*

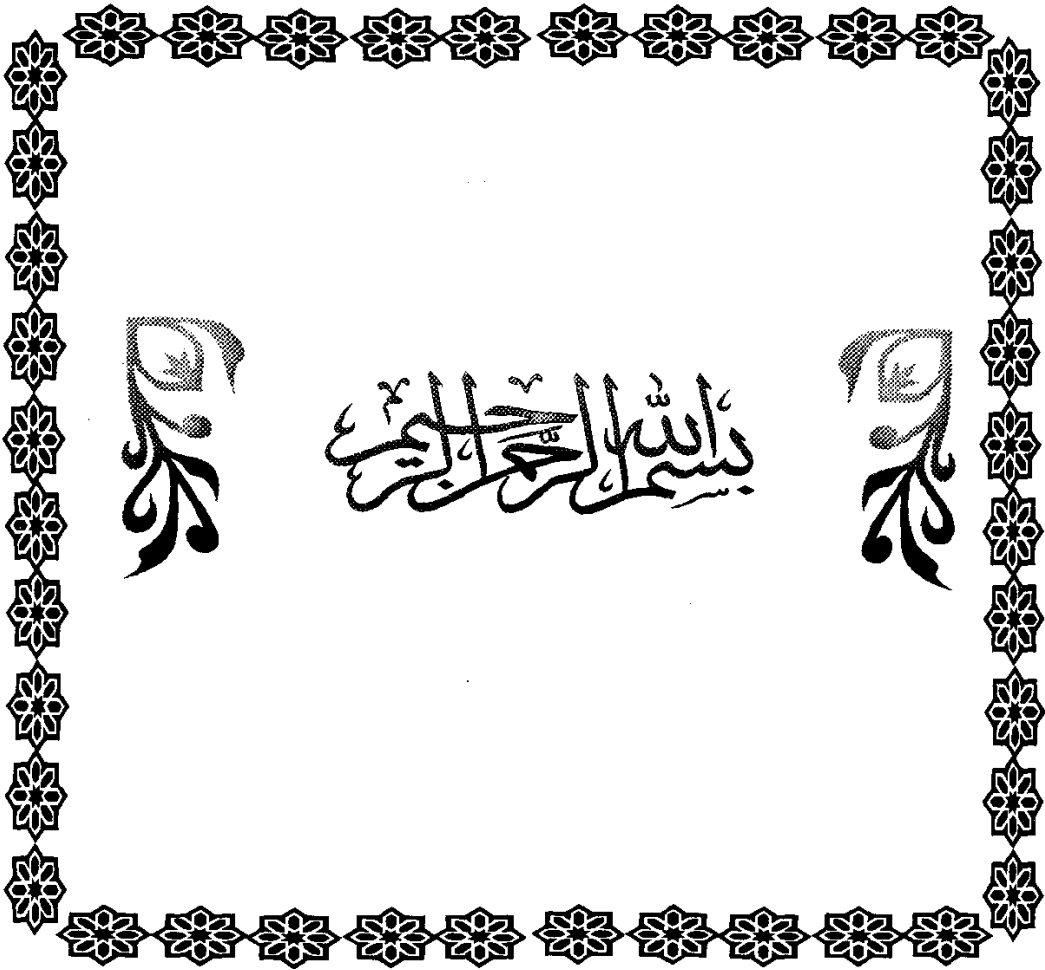
**DR . ESSAM MOHAMED SALEH**

*Lecturer of Radiation Oncology & Nuclear Medicine  
Faculty of Medicine - Ain Shams University*

**Facutly of Medicine  
Ain Shams University  
1996**







بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ





## **Acknowledgment**

First of all thanks to **GOD**

I would like to express my profound gratitude and sincere appreciation to *Prof. Dr. Salwa Massoud Ibrahim* really I was fortunate to carry this work under her supervision where I found the most valuable advice, the indispenible guidance and meticulous study. Also I would never forget the continuous encouragement and great help she offered me lastly. I owe her more than words and I thank her over and over again.

I wish to express my gratitude to professor *Dr. Schir Sayed Ismaiel* , Ass. professor of Radiation oncology and nuclear medicine for her great help and guidance .

I wish also to express my gratitude and many thanks to *Dr. Mohammed Essam Saleh* Lecturer of Radiation oncology and Nuclear medicine for his valuable instructions and close super vision.









## ***List of Content.***

- Introduction and aim of the work.....	
- Epidemiology .....	1
- Biology .....	11
- cytogenetic studies .....	41
- Pathology .....	49
- Pathophysiology .....	67
Diagnosis .....	82
- Differential Diagnosis .....	129
- Staging and prognosis .....	146
- Evaluation of treatment response .....	163
- Treatment .....	168
-English summary .....	220
- Referance .....	223
- Arabic summary .....	269



## **List of Tables**

<b>Tab (1) Cytogenetic studies in patients with monoclonal</b>	
gammopathies.....	34
<b>Tab (2) Morphological classification of MM.....</b>	66
<b>Tab (3) Pathophysiology of MM.....</b>	68
<b>Tab (4) Factors affecting blood viscosity .....</b>	77
<b>Tab (5) Presenting Features in MM .....</b>	84
<b>Tab (6) Neurological manifestation associated with MM.....</b>	88
<b>Tab (7) Manifestations of POEMS syndrome .....</b>	91
<b>Tab (8) Propability of symptoms development in relation to RSV .....</b>	94
<b>Tab (9) Clinical manifestation of hyperviscosity syndrome .....</b>	95
<b>Tab (10) Checklist of laboratory studies for MM .....</b>	103
<b>Tab (11) Major components of serum electrophoresis.....</b>	104
<b>Tab (12) Frequency of different types of monoclonal proteirs in MM...</b>	104
<b>Tab (13) CBC parameter of 634 myeloma patients .....</b>	110
<b>Tab (14) Incidence of various marrow findings in myeloma</b>	
patients versus controls. ....	122
<b>Tab (15) Characteristic marrow findings in contrast to &gt; 10% p</b>	
lasmacytosis.....	122
<b>Tab (16) Diagnostic criteria for myeloma, myeloma variants and</b>	
MGUS.....	127
<b>Tab (17) Diseases with M-protein production.....</b>	130

<b>Tab (18) Laboratory findings that suggest Myeloma rather than MGUS .....</b>	<b>131</b>
<b>Tab (19) Characteristics of PCL .....</b>	<b>136</b>
<b>Tab (20) Characteristics of Ig D Myeloma.....</b>	<b>137</b>
<b>Tab (21) Comparison of clinical manifestation of IgD and other myelomas.....</b>	<b>138</b>
<b>Tab (22) Characteristics of patients with ptasma cell tumors.....</b>	<b>141</b>
<b>Tab (23) Durie salmon clinical staging system.....</b>	<b>147</b>
<b>Tab (24) Survival duration of different stages of Durie - salmon system. ....</b>	<b>146</b>
<b>Tab (25) British medical research cauncil staging system .....</b>	<b>148</b>
<b>Tab (26) Stratification according to B2 M and age .....</b>	<b>152</b>
<b>Tab (27) Statification according to B2M and albumin .....</b>	<b>152</b>
<b>Tab (28) Interrelation between B2M and clinical staging system.....</b>	<b>153</b>
<b>Tab (29) Simplified prodnostic classification of MM.....</b>	<b>156</b>
<b>Tab (30) Stratification according to CRP and B2M .....</b>	<b>159</b>
<b>Tab (31) Histopathological prognostic factors .....</b>	<b>161</b>
<b>Tab (32) List of adverse pathological factors .....</b>	<b>162</b>
<b>Tab (33) Response criteria in MM by chromic Leukemia - Myeloma Task Force .....</b>	<b>164</b>
<b>Tab (34) SWOG myeloma response definition .....</b>	<b>166</b>

<b>Tab (35)</b> effects of some major Trials of single alkylating agents alone on in combination with prednisone on survival in multiple myelome .....	185
<b>Tab (36)</b> Selected schedules using intermittent or continuous schedules of alkylating agents for treatment myeloma (alone or in combination with prednisone) .....	186
<b>Tab (37)</b> Dosage schedules of the M2 and the VMCP-VBAP regimens	190
<b>Tab (38)</b> results of CCT regimens used for remission induction in MM versus MP and had statistically significant improvement in survival.....	192
<b>Tab (39)</b> Results of CCT regimes used for induction remission that failed to show survival advantage over MP .....	193
<b>Tab (40)</b> Dosage schedule for VAD regimen .....	202
<b>Tab (41)</b> Refractory myeloma, classification approach to treatment...	203
<b>Tab (42)</b> Treatment plan of Gianni et al 1994 regimens .....	207

