بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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Impact of mucosal biofilm and bony osteitis on chronic rhinosinusitis with nasal polyps

Thesis

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in **Otorhinolaryngology**

By

Tarek Mohamed Gamal Eldin Hassan Abdalla Ashmawy

M.B.B.CH, MS in Otorhinolaryngology, Ain Shams University.

Supervised by

Prof. Dr. Hassan Alaa El Ibiary

Professor of Otorhinolaryngology

Faculty of Medicine- Ain Shams University

Prof. Dr. Naglaa Samir Ahmed

Professor of Pathology

Faculty of Medicine- Ain Shams University

Prof. Dr. Ehab Kamal Hakim

Professor of Otorhinolaryngology

Faculty of Medicine - Ain Shams University

Faculty of Medicine

Ain Shams University

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Tarek Mohamed Gamal Eldin Hassan Abdalla Ashmawy

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List of Abbreviations

Abbr.	Full-term
BBF	**:** Bacterial biofilm
CI	**:** Confidence interval
CRS	**:** Chronic rhinosinusitis
CRSsNP	**:** Chronic rhinosinusitis without nasal polyps
CRSwNP	**:** Chronic rhinosinusitis with nasal polyps
CT	**:** Computerized tomography
EPOS	**:** European position paper on rhinosinusitis and nasal polyp
FESS	**:** Functional endoscopic sinus surgery
FISH	**:** Fluorescent in situ hybridization
HPF	**:** High power field
IL	**:** Interleukin
LM	**:** Light microscope
LMS	**:** Lund Mackay Score
MMP	**:** Matrix metalloproteinase
NPs	**:** Nasal polyps
PAS	**:** Periodic acid Schiff
PBS	**:** Phosphate buffered saline

QOL **:** Quality of life

SD **:** Standard deviation

SE **:** Standard error

SEM **:** Scanning electron microscope

SNOT-22 **:** Sinonasal outcome treatment score

SPECT **:** Single photon emission topography

SPSS **:** Statistical package for social science

TGF **:** Tissue growth factor beta

TH **:** T-helper

TNF : Tissue necrotic factor

3D **:** 3-Dimensional

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Introduction

Chronic rhinosinusitis (CRS) is a common inflammatory disorder whose underlying aetiopathogenesis has not yet been completely understood and appears to be multifactorial, Microbial biofilms and bony osteitis are gaining an increased concern as they are considered to be among the possible factors that contribute to the overall local inflammatory load in CRS **(**Bassiouni et al., 2012).

In spite of the maximal medical and surgical therapy, there are still 10–20 % CRS patients having persistent and recurrent inflammation. Bacterial biofilm (BBF) have been proposed as a potential pathogenic factor for CRS. BBF may be an important factor for the high resistance to antibiotics and host immune mechanisms. There is much evidence suggesting the link between bacterial biofilm and CRS, but there is little knowledge about its real contribution in the pathogenesis of CRS (Al-Mutairi and Kilty, 2011).

BBF are highly organized 3-dimensional bodies constituted of groups of bacteria encased inside a protective extracellular polysaccharide matrix, which are recalcitrant to both antibiotic therapy and host immune mechanisms (Chen et al., 2012). With the use of a variety of techniques, BBF have been consistently showed on the mucosa of patients with CRS among an ever-expanding research body, with a prevalence of 30% to 80% (Al-Mutairi and Kilty 2011), (Foreman et al.,

2011),(Foreman et al., 2012); and their existence has been correlated with worse parameters of the disease, post-surgical results, a greater prevalence of infection recurrence, and an elevated Sino-Nasal Outcome Test (SNOT)22 – score (Foreman et al., 2011),(Foreman et al., 2012), (Singhal et al., 2011), (Tan et al.,2012), (Li et al., 2012) and (Zhang et., 2015) Their existence has also been associated with increased disease severity that's in mostly refractory to the present treatment paradigms (Foreman et al., 2011).

Osteitis is the bone inflammation that is devoid of marrow space (Bhandarkar et al., 2011). In CRS, it is still uncertain whether osteitis is triggered via direct bacterial invasion, which is still not elucidated in researches, or possibly is secondary to mediators of inflammation (Bhandarkar et al., 2011) and (Georgalas 2013). The prevalence of osteitis is between 36% to 79% in patients with CRS depending on radiographic criteria, findings of single-photon emission computerized tomography (SPECT) or pathologic results (Lee et al., 2006), (Saylam et al., 2009) and (Snidvongs et al., 2013). The degree of bony osteitis was correlated with disease severity and results after medical and surgical management (Snidvongs et al., 2013) and (Bhandarkar et al., 2013). Moreover, the existence of bony osteitis is correlated with a decreased potential for a better change in certain quality-of-life outcome (QOL) values (Bhandarkar et al., 2011).