

Corneal abscesses profile and management : a 5 years experience in a tertiary eye care center

ABSTRACT :

Aims : to define the epidemiological, clinical, bacteriological, therapeutic and progressive characteristics of severe corneal abscesses treated in a tertiary eye care center.

Study Design : Retrospective Study.

Place and Duration of study : the ophthalmology department of The Mohammed V Military Medical Training Hospital in Rabat, and covering patients with corneal abscesses from January 2014 to December 2018.

Results : We report 30 cases of severe corneal abscess. With a sex ratio of 1.2 , average age of 42.20 years, ranging from 16 to 74 years. The average consultation time after the onset of the first symptoms was 6.6 days with extremes of 2 to 14 days. The initial visual acuity, at the time of hospitalization, was between 03/10 and absence of light perception. The diameter of the abscess was between 2 and 5 mm in 6 cases (20%) and greater than 5 mm in 24 cases (80%). For 4 patients the light perception was negative before hospitalization. For 5 patients, the infection did not have much impact on function of which two patients recovered 10/10 , and for 16 patients the acuity remained reduced (between positive light perception at 01/10). Eight patients were cold programmed for corneal transplantation. And 4 cases for evisceration.

KEYWORDS: corneal abscess; severe; epidemiology

INTRODUCTION

Corneal abscesses are a group of serious conditions, it is one of the main causes of corneal blindness. The prevalence of this condition, about 0.148% is constantly increasing [1], due to the frequency of risk factors. Epidemiological and microbiological characteristics are variable. The main risk factors for corneal abscesses are eye trauma in developing countries and contact lens wear in industrialized countries[2] This serious pathology and reserved prognosis is formidable because of the difficulty of its etiological diagnosis and therapeutic management. The positive diagnosis is clinical. The etiological diagnosis is essentially microbiological, based on corneal samples[3] Therapeutic management must be early and oriented according to the etiological investigation and abscess appearance to avoid the occurrence of serious complications and permanent sequelae[4]. Corneal perforation and endophthalmitis are the most serious complications and visual acuity is often reduced by central corneal opacity[5]. The purpose of our study is to define the epidemiological, clinical, bacteriological, therapeutic and progressive characteristics of severe corneal abscesses treated in the ophthalmology department of the Mohamed V Military Training Hospital (HMIMV) in Rabat (Morocco).

MATERIALS AND METHOD:

This is a retrospective study of a series of 30 eyes from 29 hospitalized patients in the ophthalmology department of the HMIMV in Rabat between January 2014 and December 2018. Our inclusion criteria were: an abscess diameter greater than 2 mm and a depth greater than 50% of the corneal thickness, a state of immunosuppression, poor treatment compliance, central location of the lesion, intraocular inflammation, pre-perforation and a fortiori

48 perforation. The exclusion criteria were: Any non-severe abscess with a diameter less than 2
49 mm and a depth less than 50% of the corneal thickness.
50 The parameters studied were: age, sex, time of consultation after symptom onset, risk factors,
51 initial and subsequent visual acuity (evaluated by the Snellen scale), the microbiological
52 results of the corneal samples taken, treatment introduced in the department and evolution.
53 We also took into account the following clinical characteristics: the size of abscess, location
54 (central, paracentral, peripheral), existence of a Endocular inflammation. For each abscess a
55 corneal **scraping** was performed.

56 **RESULTS :**

57 We have reported 30 cases of severe corneal abscess in 29 patients over a 5-year period.
58 The **male-to-female** ratio was 1.2 (16 men to 13 women). The average age was 42.20 years,
59 ranging from 16 to 74 years.

60 The **abscess** was always unilateral (40% **OD** and 60% **OS**) except in one case.

61 The average consultation time after the onset of the first symptoms (redness of the eyes, pain
62 and decreased visual acuity) was 6.6 days with extremes of 2 to 14 days.

63 Eight risk factors were objectively assessed in 27 patients, representing 93.1% of cases,
64 including

65 some with two risk factors at the same time (**Table I**)

66 Clinical aspects :The initial visual acuity, at the time of hospitalization, was between 03/10
67 and absence of light perception. On initial examination, 27 abscesses were central (Figure 1)
68 and 3 were paracentral. There was no inflammatory reaction of the anterior chamber in 10
69 cases (33.3%) with **hypopyon** in 6 cases, and in 7 cases (23.3%) the anterior chamber was not
70 examinable because of the large volume of the abscess. The diameter of the abscess was
71 between 2 and 5 mm in 6 cases (20%) and greater than 5 mm in 24 cases (80%).

72 Microbiological characteristics : A **microorganism** was identified in 14 patients (48.2%).

73 Multimicrobial damage was found in 10 patients. Staphylococcus coagulase negative and
74 Pseudomonas aeruginosa were the most common germs. (**Table II**)

75 **EVOLUTION :**

76 The average length of hospital stay was 19 days (extremes from 7 days to 27 days), and the
77 average follow-up of patients was 6 months. Two patients were lost to follow-up.

78 The complications observed were: corneal perforation in 6 patients, corneal
79 neovascularization (Figure 2) in 12 patients, and a disabling corneal **opacification** in 21
80 patients.

81 **For 4 patients the light perception was negative at admission. For 5 others, the infection did**
82 **not have impact on visual acuity with two of them recovering 10/10** . For 16 patients the
83 visual acuity remained reduced (between positive light perception to 01/10).

84 Eight patients were **programmed for a therapeutic penetrating keratoplasty**. **4 patients needed**
85 **evisceration**.

86 **DISCUSSION :**

87 **This study included severe corneal abscesses that required hospitalization excluding cases of**
88 **corneal abscesses that responded well to ambulatory treatment.**

89 In our series corneal abscesses affect all age groups, with a predilection of the adult whose
90 age varies between 16 and 74 years, and with a slight male predominance, 16 men for 13
91 women (sex-ratio=1.2). These results are consistent with the data in the literature[6].

92 Risk factors are identifiable in more than 9/10 cases (90%) in large series [3] (27/29 cases
93 (93.1%) in our series). They vary from one region to another. Indeed, eye trauma is the
94 leading cause of corneal abscess in developing countries, 65.4% in southern India [6] while
95 hydrophilic soft lens wear is the leading cause in industrialized countries [7], 52% in the
96 United States[8] and 26% in New Zealand [5].

97 In our series the wearing of contact lenses (24.1%) and eye trauma (20.6%) are the most
98 frequent causes and in 3rd place (13.4%) cataract surgery, corneal ulcer on dry eye syndrome
99 and diabetes complicated diabetic retinopathy or not, in 4th place the pillowcases on ulcer of
100 cornea, and the other risk factors also identified were immunosuppression on cancer and self-
101 medication with eye drops containing corticosteroids.

102 Our germ isolation rate was 48.2% close to that of the American series (53% to 73%) [2]. The
103 relative frequency of the different bacteria responsible for corneal abscess varies greatly from
104 one region to another[5]. Pseudomonas is the most common bacterium in Bangladesh
105 (30%)[9] (1983), Taiwan (37.7%)[10] (2004) and France (29.2%)[2] (2006), Staphylococcus
106 aureus in India (65%)[11] (1983), Streptococcus pneumoniae in South Africa (38%)[12]
107 (1985). In our series staphylococcus coagulase negative is the most incriminated germ
108 (20.6%), compared to the results of the study by Bourcier et al, whose staphylococcus
109 coagulase negative was isolated in one third of cases[13], pseudomonas aeruginosa was also
110 the most incriminated germ in our series with the same percentage (20.6%) (only contact lens
111 wearers).

112 The treatment was based on intensive topical antibiotic therapy including a loading dose and a
113 maintenance dose. Since these are vision threatening abscesses, we have given as a first-line
114 treatment after corneal sampling of fortified eye drops, prepared extemporaneously,
115 vancomycin 50mg/ml (against gram-positive) and ceftazidime 20mg/ml (against gram-
116 negative), the treatment is adjusted afterwards according to the results of the antibiotic
117 susceptibility test. The indication for systemic antibiotic therapy should only be considered if
118 there is a risk of generalization of an infection with an ocular starting point or if corneal
119 perforation raises concerns about the spread of the infection[5].

120 The use of local corticosteroids (subconjunctival) is a controversial issue: they are very useful
121 to reduce the extent of stromal scars and synechia. They were prescribed only when the
122 infection is under control, and under strict ophthalmological supervision.

123 The unfavourable functional evolution was due to the delay in consultation after the onset of
124 functional symptomatology (mean time of 7 days from 2 days to 14 days), but also to the
125 importance of the inflammatory reaction of the anterior chamber, the virulence of the germ
126 and the initial poor visual acuity.

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128 **Limitation of the study :**

129 The limits of our study reside intrinsically foremost in its retrospective and descriptive type,
130 resulting in incorporating selection biases. In addition, sometimes incomplete records and
131 extraction of data represent a major bias in order to draw the most representative profile of
132 our corneal abscesses.

133 **CONCLUSION :**

134 Corneal abscess is a serious disease, which remains a main causes of corneal blindness as 16
135 of our patients had a low final visual acuity, and even 4 needed evisceration. It can be
136 secondary to bacteria and/or fungal and/or amoebic origin even if our study didn't isolate any
137 of it. The prevalence of this condition is constantly increasing. The management of corneal
138 abscesses is difficult, it is a therapeutic emergency, and based on a prior analysis of risk
139 factors, mode of infection, and an adapted isolation for the germ in question. Hospitalization
140 is often necessary to ensure the rapid initiation of optimal treatment and close monitoring.

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142 **Ethical Disclaimer:**

143 As per international standard ,ethical approval has been collected and preserved by the author.

144 **Consent:**

145 As per international standard, patient's written consent has been collected and preserved by the
146 author(s).

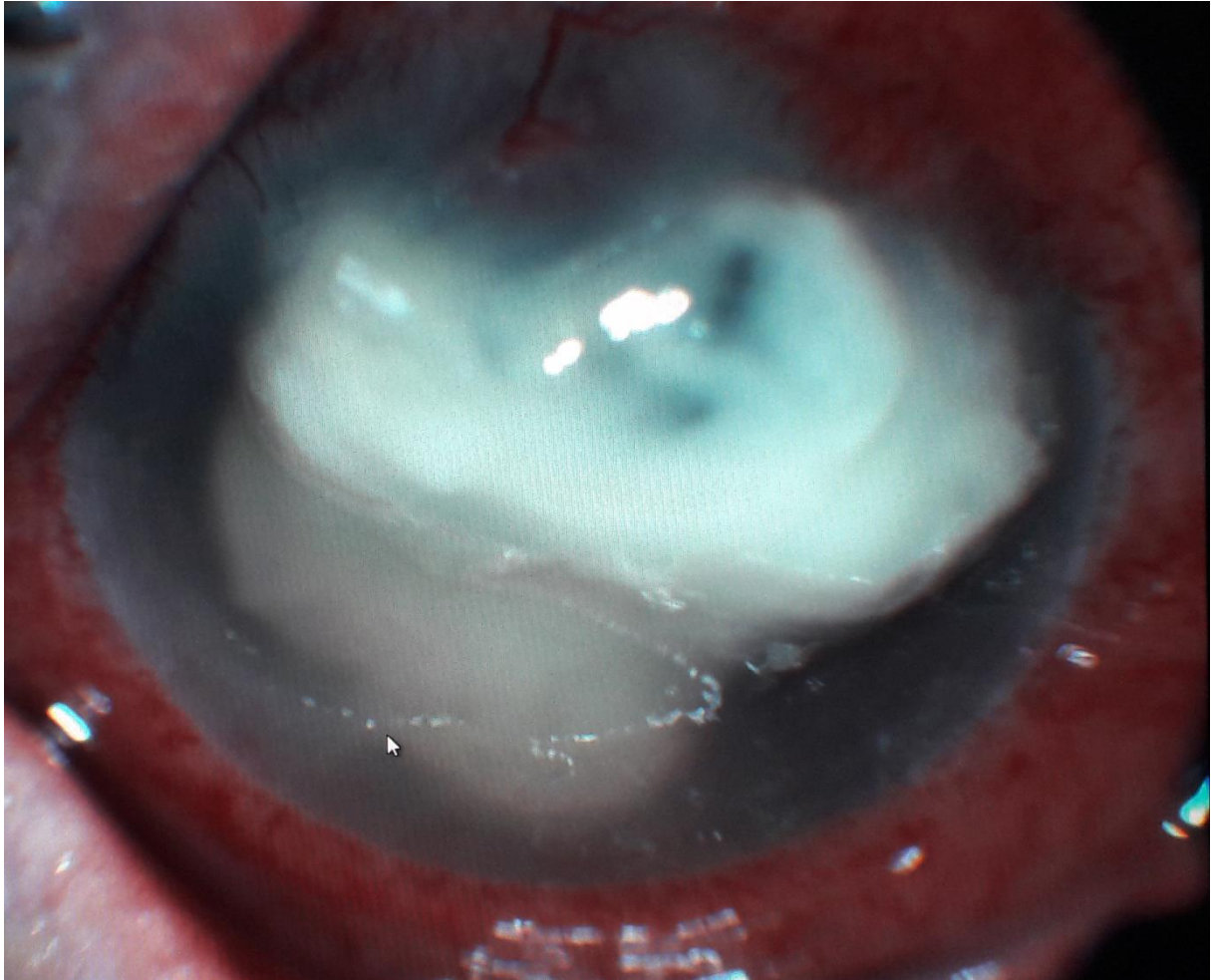
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Figure 1: Large central corneal abscess

UNDER REVIEW

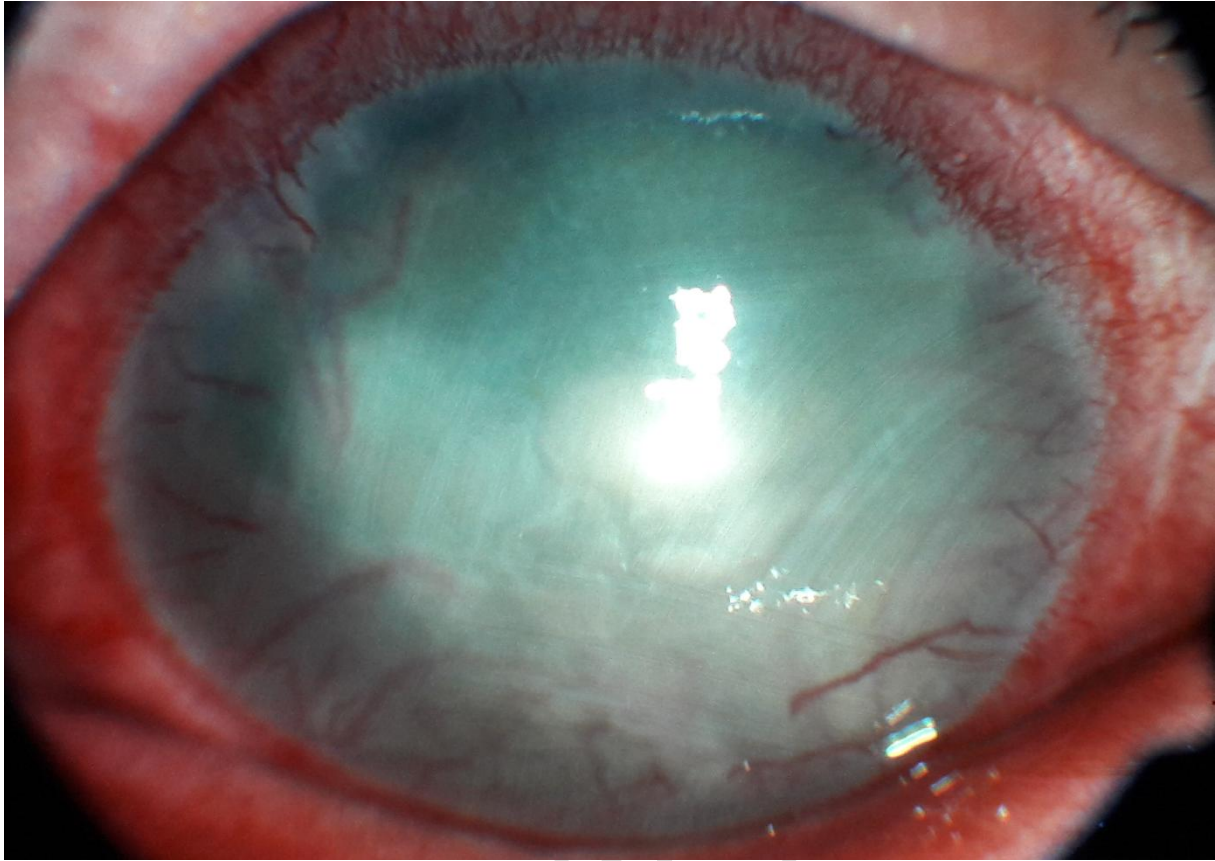


Figure 2: Central corneal flap with neovascularization

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Table I : DISTRIBUTION OF RISK FACTORS IN OUR SERIES.

RISK FACTORS	NUMBER OF CASE	PERCENTAGE
Wearing contact lenses	7	24 , 1%
Eye trauma	6	20, 6%
History of cataract surgery	4	13, 7%
Diabetes +/- diabetic retinopathy +/- neovascular glaucoma	4	13, 7%
Corneal ulcer on dry eye syndrome	4	13, 7%
Cover on corneal ulcer	3	10, 3%
Cancer therapy: radio-chemotherapy for bladder cancer or intensity-modulated radiotherapy for cavum cancer	2	6, 8%
Self-medication by eye drops containing corticosteroids	2	6, 8%
Not found	2	6, 8%

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Table II: DISTRIBUTION OF GERMS IN OUR SERIES

GERMS	NUMBER OF CASE	PERCENTAGE
Coagulase-negative staphylococci	6	20,6%
Pseudomonas aeruginosa	6	20,6%
Staphylococcus aureus	5	17,2%
Enterococcus species	2	6,8%
Neisseria species	1	3,4%
Streptococcus	1	3,4%
Haemophilus species	1	3,4%
Bacillus cereus	1	3,4%
Serratia marcescens	1	3,4%
Streptococcus pyogenes	1	3,4%
Candida albicans	1	3,4%
Sterile samples	15	51,7%

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