

Corneal abscesses: 5 years experience in tertiary eye care center

ABSTRACT :

Corneal abscesses are a group of serious conditions, it is one of the main causes of corneal blindness. The prevalence of this condition is constantly increasing, This serious pathology and prognosis reserved. 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

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 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 METHODS:

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 perforation. The exclusion criteria were: Any non-severe abscess with a diameter less than 2 mm and a depth less than 50% of the corneal thickness, with paracentral location.

The parameters studied were: age, sex, time of consultation after symptom onset, risk factors, initial and subsequent visual acuity (evaluated by the Snellen scale), the microbiological results of the

38 corneal samples taken, treatment introduced in the department and evolution. We also took into
39 account the following clinical characteristics: the size of abscess, location (central, paracentral,
40 peripheral), existence of a Endocular inflammation. For each abscess a corneal scratching was
41 performed.

42 **RESULTS :**

43 We have reported 30 cases of severe corneal abscess in 29 patients over a 5-year period.

44 The sex ratio was 1.2 (16 men to 13 women). The average age was 42.20 years, ranging from 16 to 74
45 years.

46 The infringement was always unilateral (40% ODt and 60% OGche) except in one case.

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

49 Eight risk factors were objectively assessed in 27 patients, representing 93.1% of cases, including
50 some with two risk factors at the same time (**Table I**)

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

57 Microbiological characteristics : A germ was identified in 14 patients (48.2%). Multimicrobial damage
58 was found in 10 patients. Staphylococcus coagulase negative and Pseudomonas aeruginosa were the
59 most common germs. (**Table II**)

60 **EVOLUTION :**

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

63 The complications observed were: corneal perforation in 6 patients, corneal neovascularization
64 (Figure 2) in 12 patients, and a disabling corneal flap in 21 patients.

65 For 4 patients the light perception was negative before hospitalization. For 5 patients, the infection
66 did not have much impact on function of which two patients recovered 10/10 , and for 16 patients
67 the acuity remained reduced (between positive light perception at 01/10).

68 Eight patients were cold programmed for corneal transplantation. And 4 cases for evisceration.

69 **DISCUSSION :**

70 This study concerns severe corneal abscesses that required hospitalization, thus excluding cases of
71 corneal abscesses that responded well to outpatient treatment.

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

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

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

84 Our germ isolation rate was 48.2% close to that of the American series (53% to 73%)[2]. The relative
85 frequency of the different bacteria responsible for corneal abscess varies greatly from one region to
86 another[5]. Pseudomonas is the most common bacterium in Bangladesh (30%)[9] (1983), Taiwan
87 (37.7%)[10] (2004) and France (29.2%)[2] (2006), Staphylococcus aureus in India (65%)[11] (1983),
88 Streptococcus pneumoniae in South Africa (38%)[12] (1985). In our series staphylococcus coagulase
89 negative is the most incriminated germ (20.6%), compared to the results of the study by Bourcier et
90 al, whose staphylococcus coagulase negative was isolated in one third of cases[13], pseudomonas
91 aeruginosa was also the most incriminated germ in our series with the same percentage (20.6%)
92 (only contact lens wearers).

93 The treatment was based on intensive topical antibiotic therapy including a loading dose and a
94 maintenance dose. Since these are serious abscesses, we have given as a first-line treatment after
95 corneal sampling of fortified eye drops, prepared extemporaneously, vancomycin 50mg (against
96 gram-positive) and ceftazidime 25mg (against gram-negative), the treatment is adjusted afterwards
97 according to the results of the antibiotic susceptibility test. The indication for systemic antibiotic
98 therapy should only be considered if there is a risk of generalization of an infection with an ocular
99 starting point or if corneal perforation raises concerns about the spread of the infection[5].

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

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

107 **CONCLUSION :**

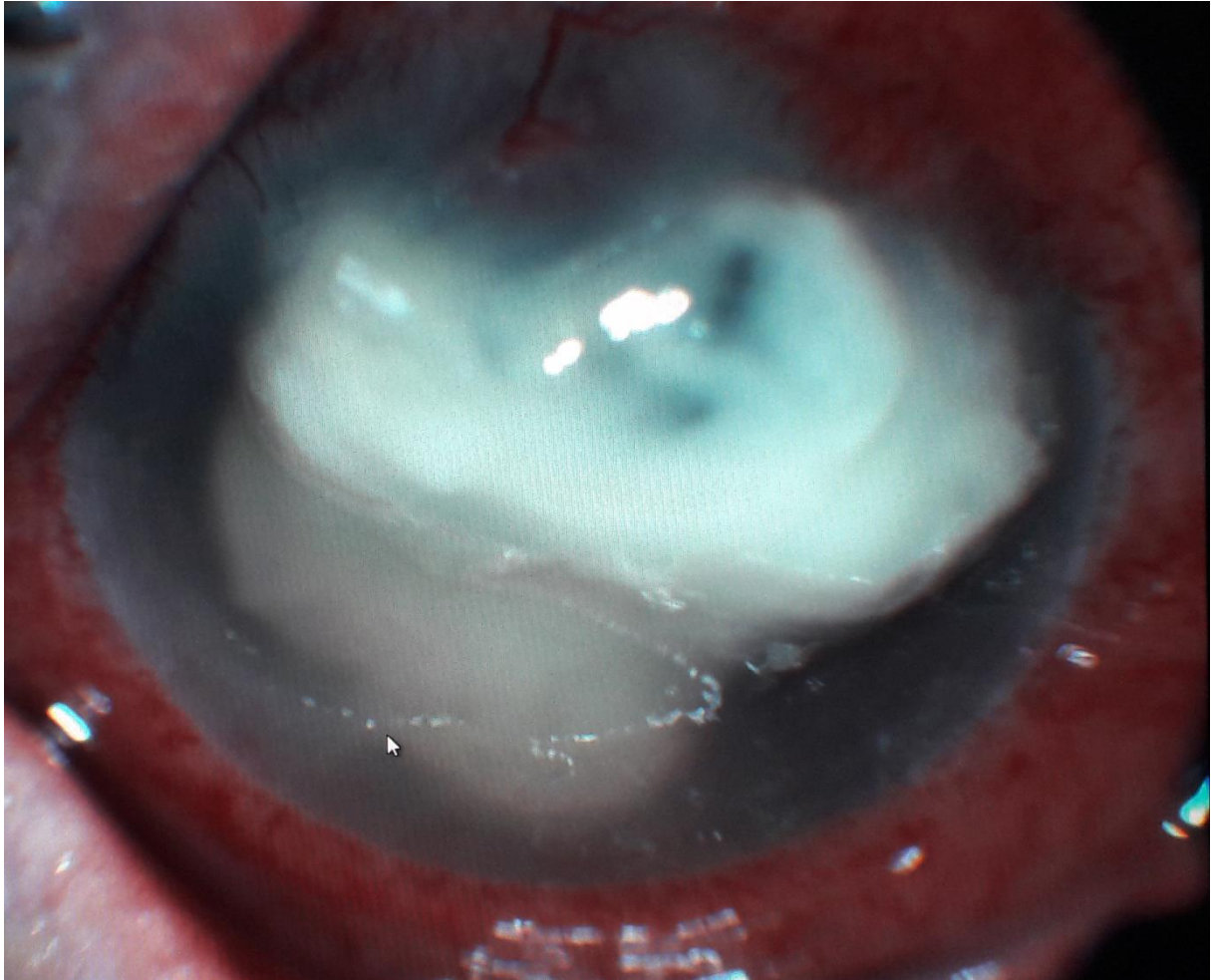
108 Corneal abscess is a serious disease, which is one of the main causes of corneal blindness. It can be,
109 in order of frequency, of bacterial and/or fungal and/or amoebic origin. The prevalence of this
110 condition is constantly increasing. The management of corneal abscesses is difficult, it is a real
111 emergency therapeutic, it is based on a prior analysis of the risk factors, the mode of infection, and

112 an adapted search for the germ in question. Hospitalization is often necessary to ensure the rapid
113 initiation of optimal treatment and close monitoring.

114 **BIBLIOGRAPHY :**

- 115 1. WONG.T; ORMONDE .S – Severe infective keratitis leading to hospital Admission
116 in New Zealand. Br.J Ophtalmol 2003;87:1103-8.
- 117 2. KERAUTRET.J ; RAOBELA. L ; COLIN.J. – Kératites bactériennes
118 Sévères : étude rétrospective clinique et microbiologique. J Fr Ophtalmol 2006; 29:
119 883- 888.
- 120 3. LIMAIEM.R; MAGHAIETH.F - Les abcès graves de la cornée : à propos de
121 100 cas. J Fr Ophtalmol, 2007 ;30,4,374-379 .
- 122 4. Sharma N. Corneal ulcers. Diagnosis and management 2008 New Delhi ; Jaypee.
- 123 5. BAKLOUTI.K; AYACHI.M – Les abcès cornéens présumés d’origine
124 Bactérienne . Bull.Soc.Belge Ophtalmol, 305 ,39-44,2007 .
- 125 6. NEUMANN.M ; SJOSTRAND.J - Central microbial keratitis in a Swedish city
126 Population . A three year prospective study in Gothenburg. Acta Ophtalmol
127 Copenh, 1993;71:160-4.
- 128 7. VERHELST.D; KOPPEN C; VAN LOOVEREN .j; and the belgian
129 keratitis study group. Bull Soc belge Ophtalmol 2005;297:7-15.
- 130 8. Erie JC, Nevitt MP, Hodge DO, Incidence of ulcerative keratitis in a defined
131 population from 1950 through 1988. Arch Ophthalmol, 1993 ; 111 : 1665-71.
- 132 9. KATZ N.N; WADUD S.A; AYAZUDDIN M - Corneal ulcer disease in
133 Bangladesh. Ann Ophthalmol 1983; 15: 834-836.
- 134 10. CHIEN-FAN F; CHIA-HUI T; FUNG-RONG - H.Clinical characteristics of
135 Microbial keratitis in a university hospital in Taiwan. Am J Ophthalmo 983; 15 : 834-836.
- 136 11. MAHAJAN V.M. – Acute bacterial infections of the eye: their etiology and
137 Treatment. Br J Ophtalmol 1983; 67: 191-194.
- 138 12. CARMICHAEL T.R; WOLPERT M; KOORNHOF H.J - Corneal ulceration at
139 An urban African hospital. Br J Ophthalmol 1985; 69: 920-926.
- 140 13. Bourcier T, Thomas F, Borderie V, Chaumail C, Bacterial keratitis: predisposing
141 factors, clinical and microbiological review of 300 cases. Br J Ophtalmol 2003;
142 87:834-8.

144



145

146 **Figure 1: Large central corneal abscess**

147

148

149

150

151

152

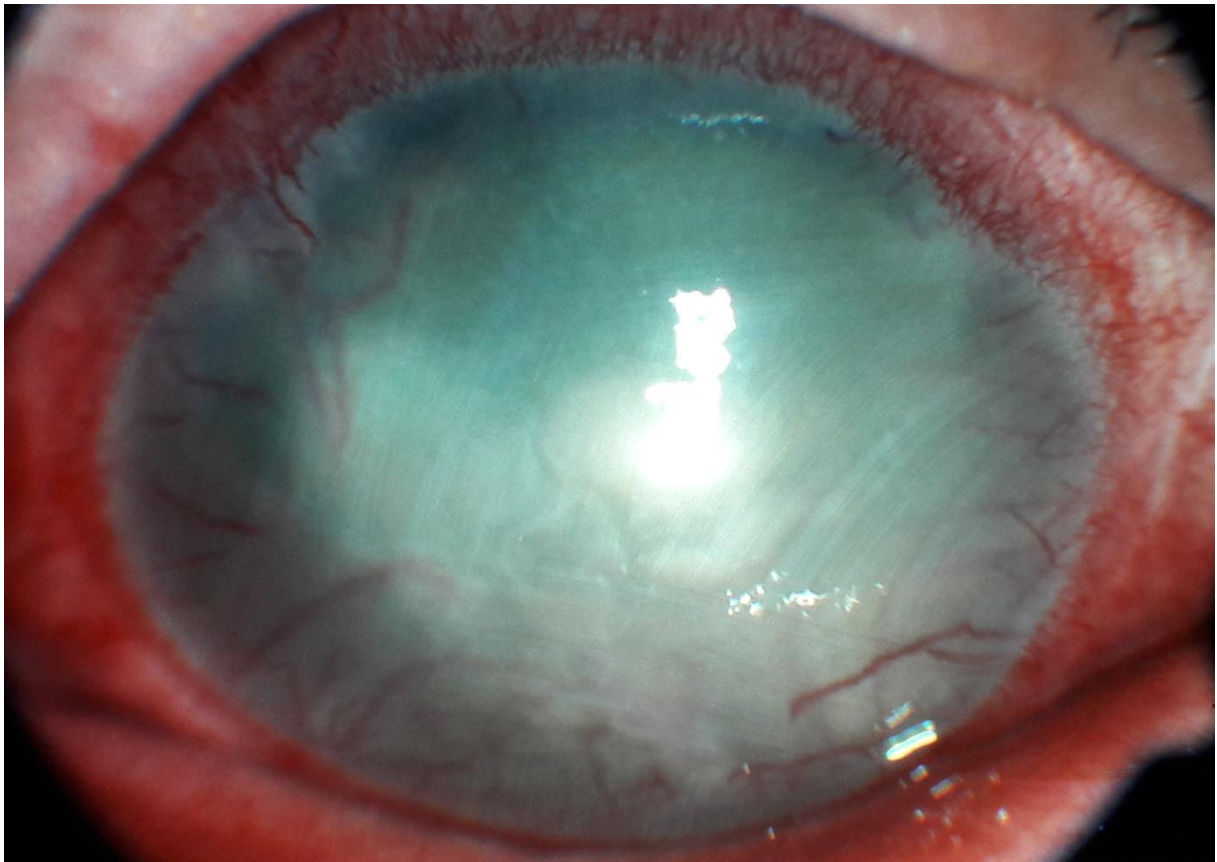
153

154

155

156

157



158

159 **Figure 2: Central corneal flap with neovascularization**

160

161

162

163

164

165

166

167

168

169

| 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% |
| Immunosuppression: radiochemotherapy for bladder cancer or cavum cancer | 2 | 6, 8% |
| Self-medication by eye drops containing corticosteroids | 2 | 6, 8% |
| Not found | 2 | 6, 8% |

170 **Table I** : DISTRIBUTION OF RISK FACTORS IN OUR SERIES.

171

172

173

174

175

176

177

178

179

180

181

182

183

184

185

186

| GERMS | NUMBER OF CASE | PERCENTAGE |
|-----------------------------------|-----------------------|-------------------|
| Staphylococcus coagulase negative | 6 | 20,6% |
| Pseudomonas aeruginosa | 6 | 20,6% |
| Staphylococcus aureus | 5 | 17,2% |
| Enterocoque | 2 | 6,8% |
| Neisseria specis | 1 | 3,4% |
| Streptocoque | 1 | 3,4% |
| Haemophilus specis | 1 | 3,4% |
| bacillus | 1 | 3,4% |
| Serratia maresceus | 1 | 3,4% |
| Pyogens groupe A | 1 | 3,4% |
| Candida albicans | 1 | 3,4% |
| Sterile samples | 15 | 51,7% |

187

188 **Table II:** DISTRIBUTION OF GERMS IN OUR SERIES

189