PYOGENIC GRANULOMAS OF THE EYE AND OCULAR ADNEXA: A STUDY OF 100 CASES*

BY *Andrew P. Ferry,* MD

INTRODUCTION

PYOGENIC GRANULOMAS HAVE RECEIVED SCANT ATTENTION IN THE OPHthalmic literature, most publications concerning this disorder having consisted of a case report or two describing a particular diagnostic or therapeutic clinical problem.

I undertook the currently reported investigation to place in better quantitative perspective the spectrum of events that lead to pyogenic granuloma formation and the clinical settings in which these lesions occur.

MATERIALS AND METHODS

I reviewed cases of pyogenic granuloma (granuloma pyogenicum) involving the eye or ocular adnexa on file in the ophthalmic pathology laboratory at the Medical College of Virginia and at Mt Sinai School of Medicine. All of these cases had been processed in those laboratories under my direction. I excluded "outside cases," such as those that had been distributed to participants in regional or national ophthalmic pathology seminars, etc.

My goal was to arrive at a total of 100 consecutive cases. Beginning with the most recently accessioned instance of pyogenic granuloma, I worked my way back chronologically until I reached the 100th case. For the purpose of this investigation, I defined a "case" of pyogenic granuloma as one arising at a given site. If the lesion recurred at the excision site, I regarded the recurrence as being the same case. Conversely, if a given patient developed a pyogenic granuloma at two different sites, I regarded these as being two cases of pyogenic granuloma.

During the course of the study I reviewed microscopically all of the sections from each case. In addition to sections stained with hematoxylin

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and eosin, which were available in all cases, special stains (eg, for microorganisms) were done in some instances. I made a particular search for the presence of foreign bodies and examined all sections in polarized light.

RESULTS

Pyogenic granuloma occurred in 98 patients at a total of 100 sites. The patients' ages ranged from 2 to 91 years. Their mean age was 34 years. Forty-nine were male and 49 were female. The preoperative clinical diagnosis (Table I) was correct in 42 cases and incorrect in 49. In seven other instances pyogenic granuloma was included among a variety of differential diagnoses. In the remaining two cases no preoperative clinical diagnosis was offered. (I included among the 42 instances of correct diagnoses three in which the preoperative diagnosis was "granulation tissue," rather than pyogenic granuloma.) Among the 49 pyogenic granulomas that were misdiagnosed clinically, the most common erroneous diagnoses were suture granuloma (13), chalazion (10), cyst (8), and papilloma (6).

TABLE I: ACCURACY OF PREOPERATIVE CLINICAL DIAGNOSIS IN 100 CASES OF PYOGENIC GRANULOMA

Correct	42
Incorrect	49
Correct diagnosis included in differential diagnosis	7
No preoperative diagnosis offered	2
Total	100

Only three patients developed recurrence of pyogenic granuloma at the site from which the original lesion had been excised. One of these three women experienced three recurrences of pyogenic granuloma following excision of the initial lesion from the conjunctiva in her inner canthal region adjacent to the site at which a Jones tube had been inserted to facilitate drainage of tears.

Of the 100 pyogenic granulomas, 42 were the aftermath of a chalazion, 40 developed at the site of surgery on the eye or its adnexa (cases of pyogenic granuloma developing after chalazion surgery are excluded from this category), 5 were the result of accidental trauma, and in the remaining 13 instances the predisposing cause was not determined (Table II).

TABLE II: PREDISPOSING FACTORS IN 100 CASES OF PYOGENIC GRANULOMA

Chalazion	42
Ocular/adnexal surgery	40
Accidental trauma	5
Undetermined	13
Total	100

CHALAZION

There were 41 patients in this category. One of them developed a pyogenic granuloma at two different sites, thereby accounting for the total of 42 cases in this group.

The mean age of the 41 patients was 28 years; the youngest was 2 and the oldest was 80 years. Eighteen were male; 23 were female. The lower lid (Fig 1) was the site in 23 cases, the upper lid in 17 cases, and in the remaining 2 instances the record did not indicate whether the pyogenic granuloma had been excised from the upper lid or from the lower lid. All except 1 of these 42 pyogenic granulomas arose from the conjunctival surface of the eyelid. In the case in which the lesion arose from the cutaneous surface, the predisposing event was the spontaneous drainage of a chalazion through the outer surface of the eyelid.

Surgical therapy of a chalazion preceded the development of pyogenic granuloma in 10 of the 42 cases (Fig 2). In 31 cases there had been no previous surgery, and in the remaining instance the record did not indicate whether or not surgery had been performed before the pyogenic granuloma arose.

None of these 42 pyogenic granulomas recurred after they were excised.

OCULAR/ADNEXAL SURGERY

There were 39 patients in this category. One of them developed a pyogenic granuloma in the inferior conjunctival fornix of both eyes following plastic surgery, thereby accounting for the total of 40 cases in this group. The mean age of the 39 patients was 40 years; the youngest was 3 and the oldest was 91 years. Twenty-one were male; 18 were female.

Among the 40 cases of pyogenic granuloma that arose as the aftermath of surgical trauma (Table III), the type of surgery was as follows: scleral buckling for retinal detachment (10), strabismus surgery (8), excision of a pterygium or pinguecula (8), plastic surgery of the eyelids (7), nasolacrimal system surgery (4), and 1 instance each of enucleation, resection of conjunctiva for Mooren's corneal ulcer, and excision of a caruncular papilloma.

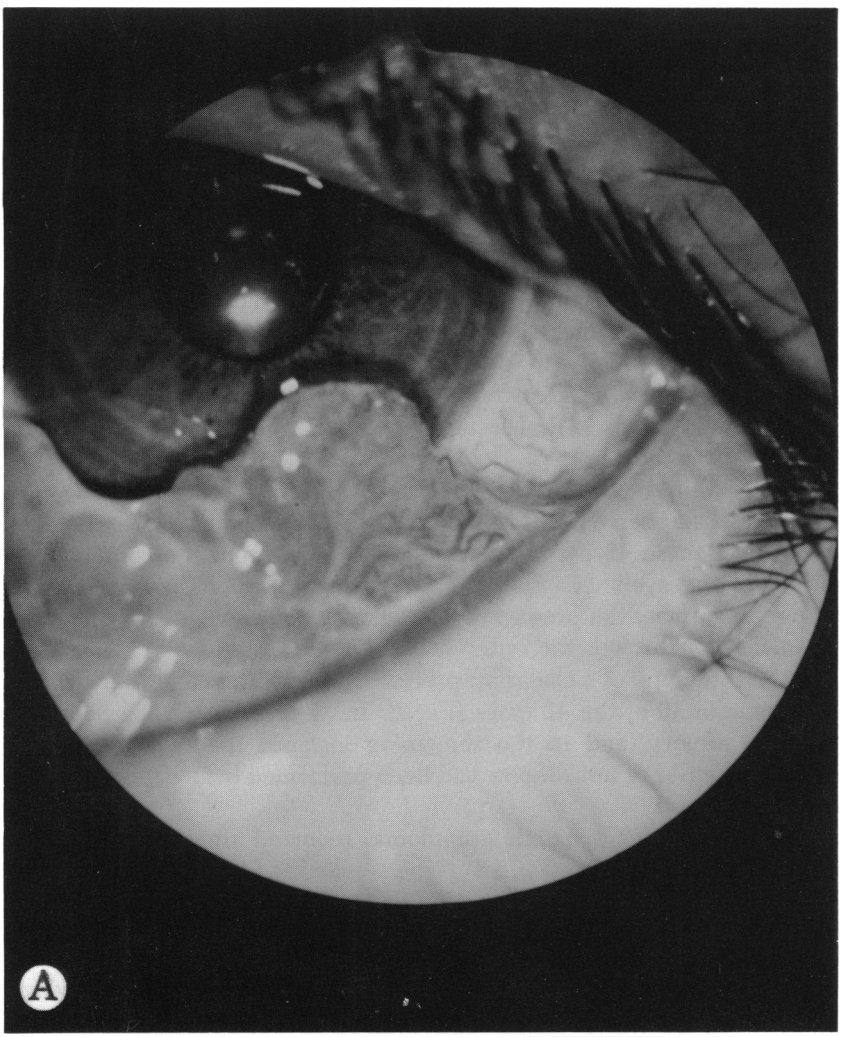
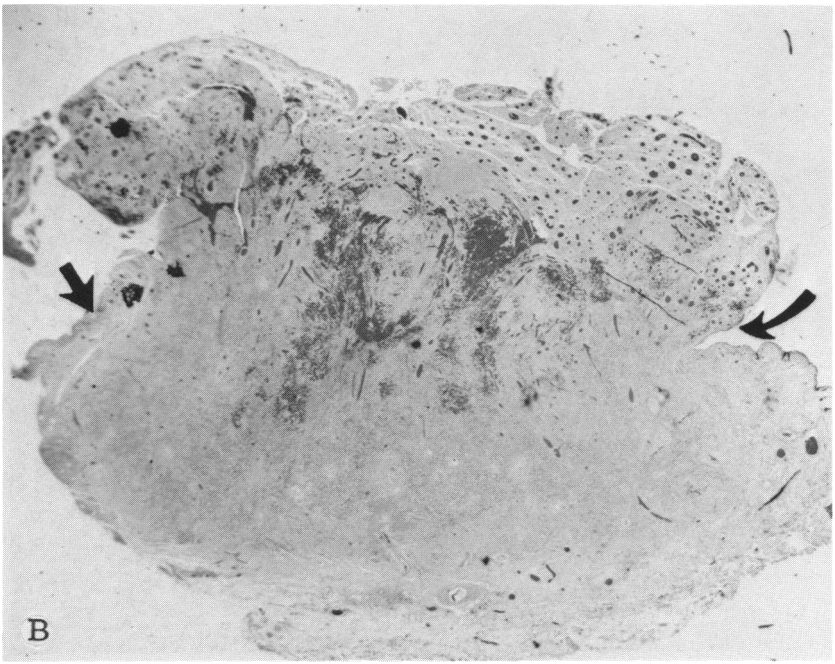


FIGURE 1

Pyogenic granuloma consequent to chalazion. A: A large fleshy mass, not all of which is included in the field, arises from the palpebral conjunctiva of the left lower eyelid. B: The upper one-half of the excised mass is a pyogenic granuloma. The lower half consists of scar tissue and residua of the chalazion that had led to pyogenic granuloma formation. The conjunctival epithelium is ulcerated over the dome of the lesion, beginning at the sites indicated by *arrows* (H&E; magnification, ×10). C: The pyogenic granuloma consists of proliferated capillaries that are engorged with erythrocytes and surrounded by edematous connective tissue containing myriads of inflammatory cells, chiefly neutrophils, lymphocytes, and plasma cells (H&E; magnification, ×120). D: At the base of the lesion two giant cells remain as aftermaths of the chalazion. They both contain Schaumann bodies (*arrows*) (H&E; magnification, ×130).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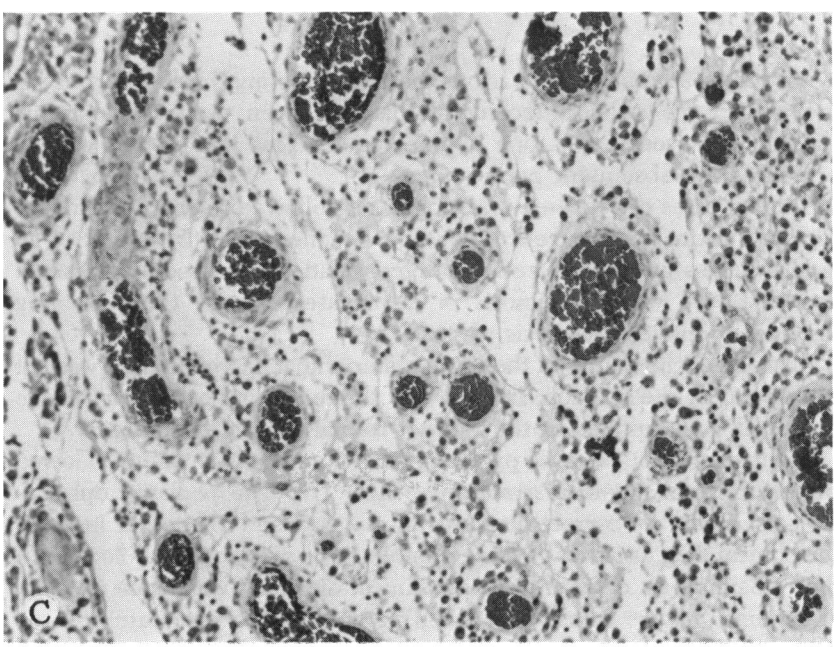
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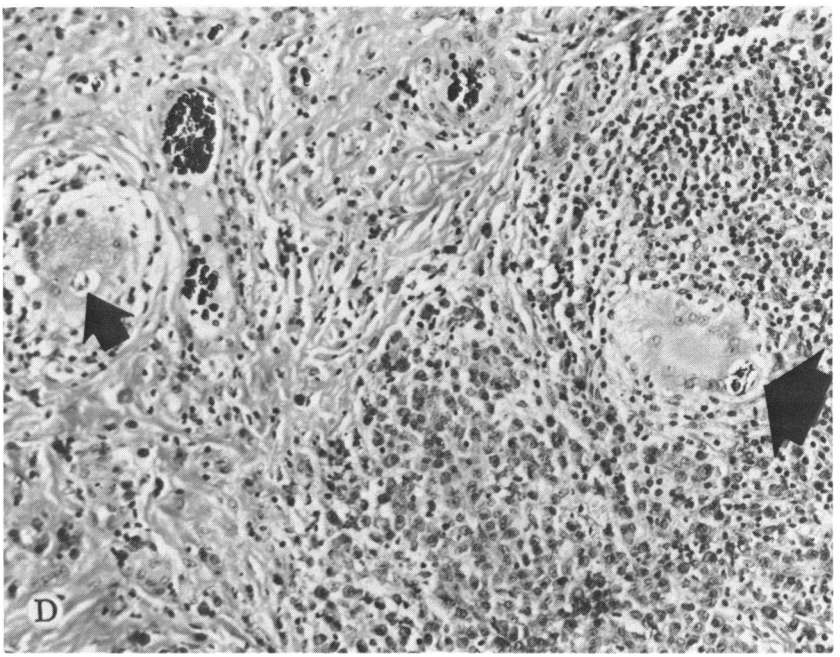

A detailed account of the various cases constituting this heterogeneous group, and the surgical technique that had been used at the initial surgery, is beyond the scope of this report. This information will be presented in subsequent publications.

The ten cases of pyogenic granuloma that followed scleral buckling for repair of retinal detachment accounted for one-fourth (Table III) of all lesions in this group. The retinal surgeon made the correct diagnosis in one case, the wrong diagnosis in eight cases, and in the remaining instance no clinical diagnosis was offered.

In six cases the nature of the seton material that had been used was not mentioned by the surgeon. In all four of the remaining patients a silicone band had been applied at the time of retinal detachment surgery.

Eight of the 40 cases of pyogenic granuloma in this group followed surgery for correction of strabismus (Table III). The pediatric ophthalmologist made the correct diagnosis in one case and in another instance the clinical diagnosis was "suture granuloma or pyogenic granuloma." In the remaining six cases the wrong clinical diagnosis was made ("suture granuloma" in five cases and "Tenon's granuloma" in one case).

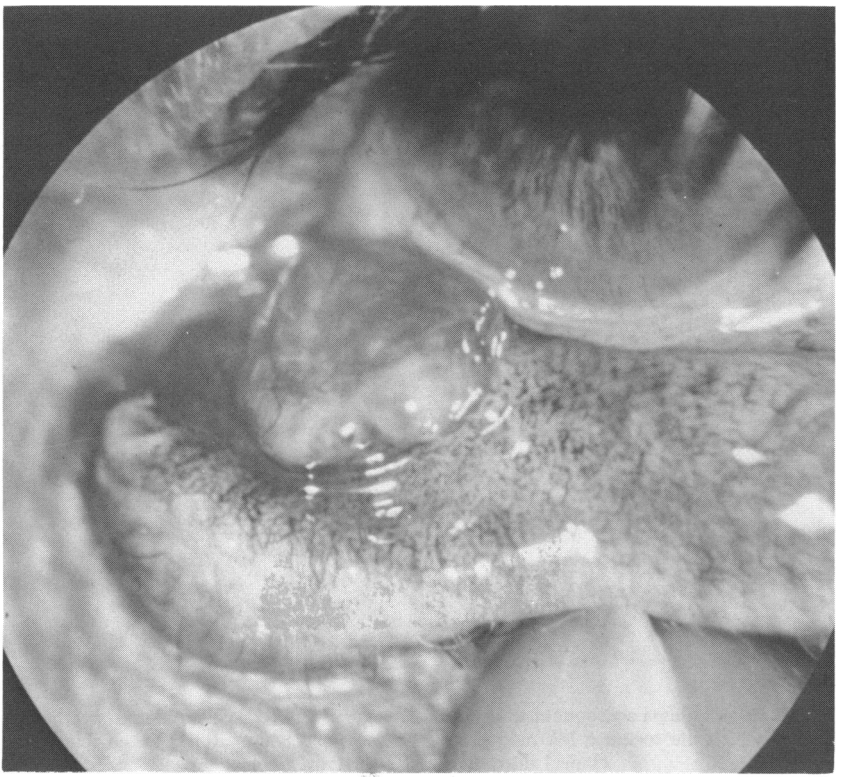

FIGURE 2
Pyogenic granuloma consequent to chalazion. A polypoid, fleshy mass arises from the palpebral conjunctiva at the site of incision and drainage of a chalazion.

The patient whose eye is illustrated in Fig 3A is typical. Six weeks before this photograph was made she underwent recession of both medial rectus muscles. Within several weeks a polypoid, red, smooth-surfaced mass arose from the area overlying the point at which the recessed left medial rectus muscle had been reattached to the sclera. The clinical diagnosis was suture granuloma. Histopathological examination of the excised lesion showed a characteristic pyogenic granuloma (Fig 3B). No suture material, epithelioid cells, or foreign body giant cells were present.

Plastic surgery of the eyelids and the nasolacrimal system accounted for more than one-fourth of the cases in this group (Table III). One of the four patients in the nasolacrimal category had undergone excision of a punctal

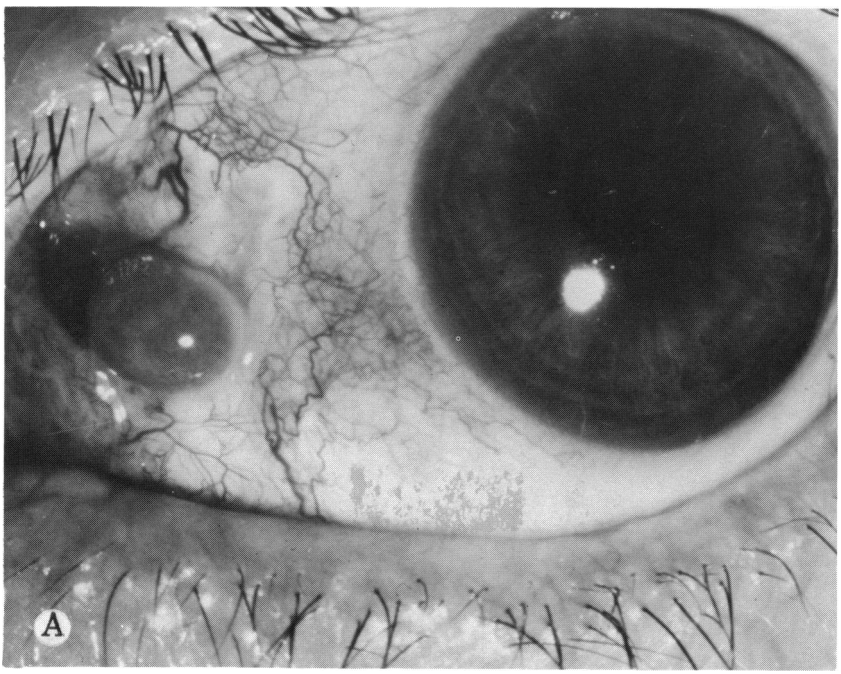

FIGURE 3
Pyogenic granuloma consequent to strabismus surgery. A: A red, polypoid mass overlies the site at which the recessed left medial rectus muscle had been sutured to the sclera. The clinical diagnosis was "suture granuloma."

papilloma. The other three had been subjected to nasolacrimal duct surgery, with implantation of a Jones tube. In each of these three cases a pyogenic granuloma arose from the conjunctiva adjacent to the Jones tube. One woman experienced three recurrences of the lesion following its initial excision; a second patient developed a single recurrence.

The patient whose left eye is shown in Fig 4 underwent recession of the retractor muscles of both lower eyelids as treatment for lid retraction caused by thyroid gland dysfunction. She developed a pyogenic granuloma in the inferior cul-de-sac bilaterally. The photograph of the lesion arising from her left inferior cul-de-sac was made immediately before excision of the pyogenic granuloma, 5 weeks after she had undergone recession of the retractor muscles.

ACCIDENTAL TRAUMA

In five patients the event leading to pyogenic granuloma formation was

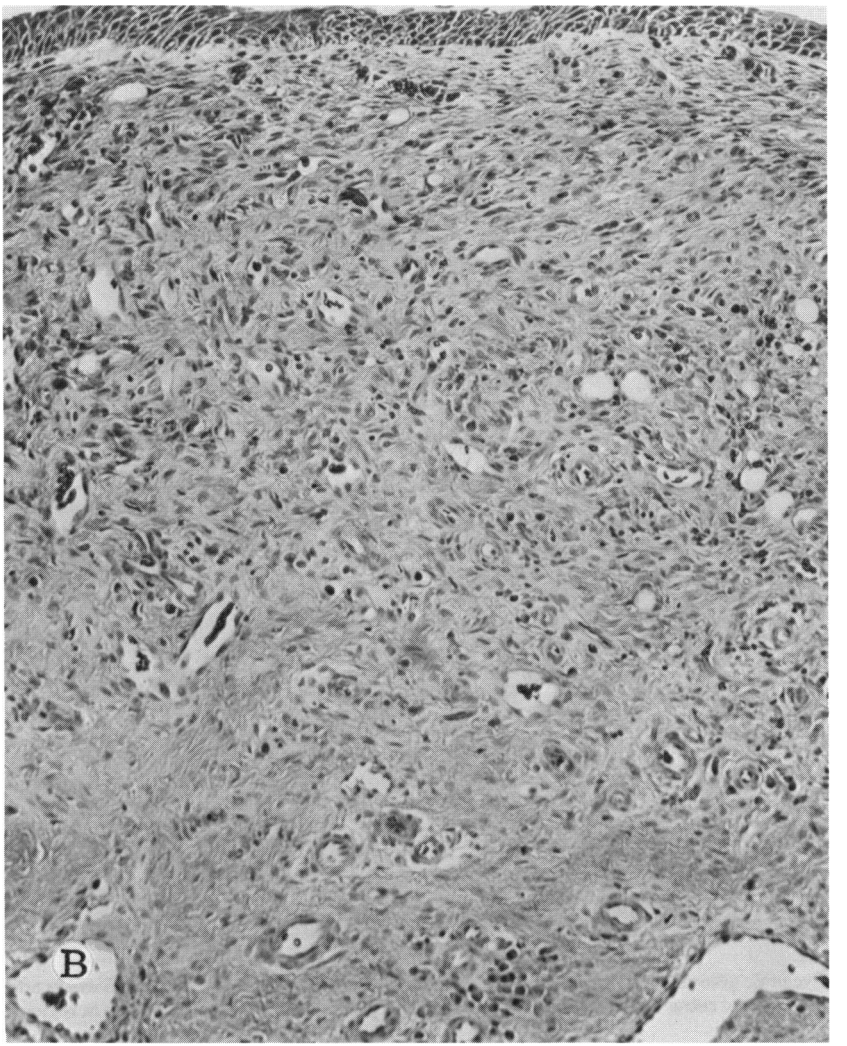

FIGURE 3 (CONT'D)
B: The excised lesion is a pyogenic granuloma. There is prominent proliferation of fibrous tissue and capillaries, with an associated intense infiltration of inflammatory cells, chiefly lymphocytes, plasma cells, and neutrophils (H&E; magnification, ×100).

accidental trauma (Table II). Their ages ranged from 8 to 40 years. All were male.

One of the patients was an 8-year-old rural boy who appeared in the eye clinic with a large, purplish-red, fungating mass protruding from the

TABLE III: TYPE OF SURGERY PRECEDING PYOGENIC GRANULOMA FORMATION

SURGERY	NO. OF CASES
Scleral buckling for retinal detachment	10
Strabismus	8
Excision of pterygium or pinguecula	8
Plastic surgery of eyelids	7
Nasolacrimal system	4
Enucleation	1
Resection of conjunctiva for Mooren's ulcer	1
Excision of caruncular papilloma	1
Total	40

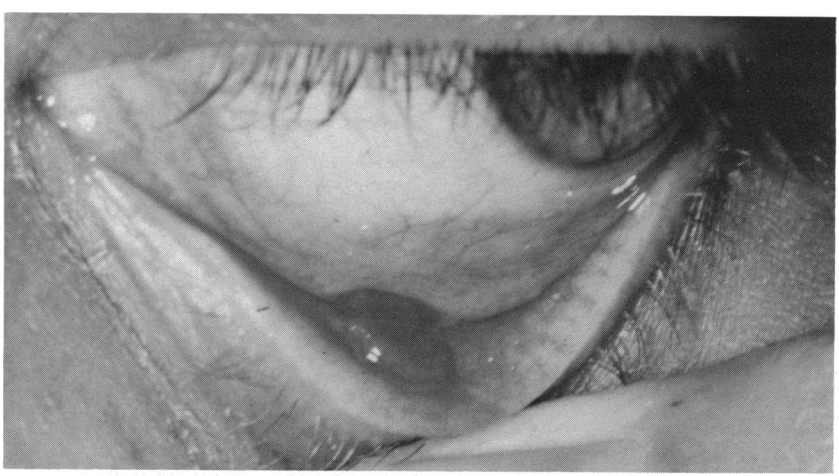

FIGURE 4
Pyogenic granuloma consequent to plastic surgery of eyelid. Photograph made 5 weeks after recession of retractor muscles of left lower eyelid. Lesion arises from conjunctiva in region of cul-de-sac.

superonasal aspect of the conjunctiva of his right eye (Fig 5). His family said he had been kicked in the face by a horse several weeks previously and that the mas had appeared a week or so thereafter. It had grown rapidly in the interim. Although I strongly considered the possibility of orbital rhabdomyosarcoma in the differential diagnosis, biopsy of the lesion proved it to be a pyogenic granuloma.

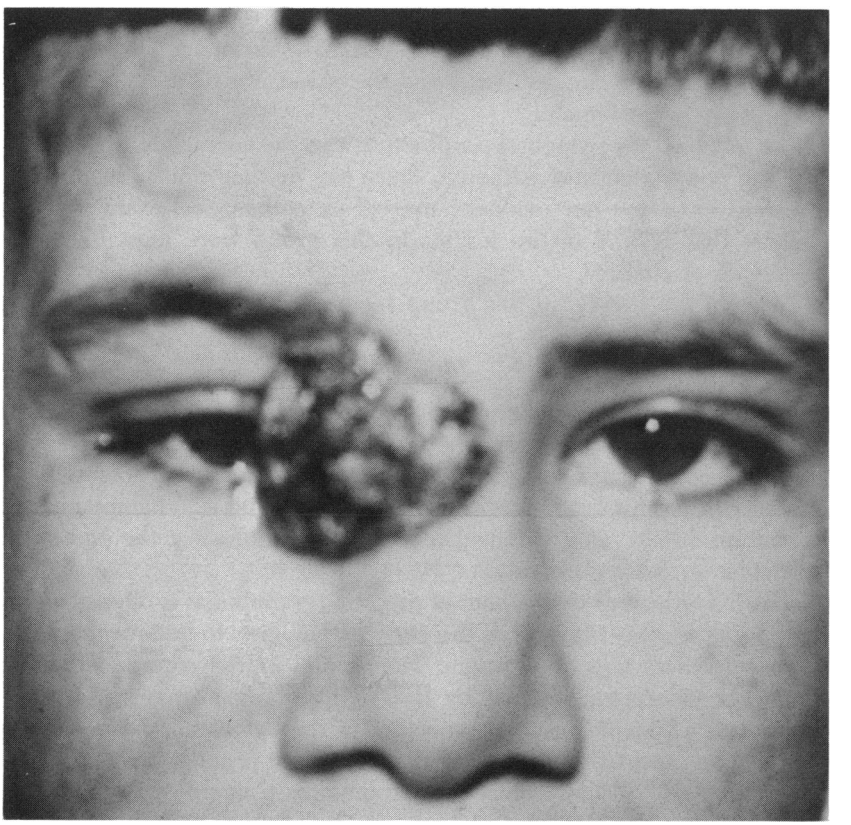

FIGURE 5
Pyogenic granuloma consequent to accidental trauma. A large, purplish-red fungating mass originates from the superonasal aspect of the conjunctiva several weeks after this boy had been kicked by a horse.

The second patient in this group developed a pyogenic granuloma of the plica semilunaris after being struck in the eye by a football. The third patient sustained a lye burn that led to pyogenic granuloma formation in the palpebral conjunctiva of his upper eyelid. The fourth patient developed a pyogenic granuloma of the palpebral conjunctiva after sustaining an injury in which sawdust and cow manure reportedly entered the eye. The last patient in this group developed a pyogenic granuloma following laceration of an eyelid in an automobile accident. Whether the genesis of the lesion is better attributed to the accidental trauma itself, or to the subsequent surgical repair, is uncertain.

None of the lesions in this group recurred.

CAUSE UNDETERMINED

There are 13 cases in this group (Table II). The mean age of the patients was 38 years; the youngest was 9 and the oldest was 67 years. Five were male; eight were female.

Ten involved the palpebral conjunctiva, two the cutaneous aspect of the lid, and one the cornea. Although there was neither clinical history of a previous chalazion nor evidence thereof on pathological examination, I believe that several of the lesions in this group were most likely the aftermath of chalazia.

None of the lesions in this group recurred.

DISCUSSION

Poncet and Dor[1,2] are generally given credit for having been the first to call attention to this disorder. They referred to it as "human botryomycosis" and regarded it as being identical with botryomycosis of horses.[3] They remarked that this lesion was known to veterinarians as "champignons de castration du cheval," pedunculated tumors that arose at the end of the testicular cord after castration.

The inflammatory component of pyogenic granulomas is often strikingly prominent, causing most of the early pathologists to believe that these lesions were of infectious origin. Poncet and Dor[1,2] regarded them as being secondary to infection by Botryomyces organisms, while others implicated pyogenic bacteria, specifically staphylococci.[3,4] Despite the fact that re-inoculation of the organism does not produce the lesion, the view was held for many years that "granuloma pyogenicum" was caused by infection of a small wound.[3]

Apart from the inappropriateness of the adjective "pyogenic," these lesions are not granulomas. The older school of thought did loosely apply the term "granuloma" to any tumor-like mass of chronic inflammatory tissue (granulation tissue + oma). The distinction was mainly useful to clinicians in separating certain inflammatory processes from neoplasms. But currently the emphasis is on the microscopic features exhibited by the lesions in deciding whether the inflammatory process is of granulomatous or nongranulomatous type. Those lesions characterized by a significant proliferation of large mononuclear cells, and particularly of their modified forms known as epithelioid cells and giant cells, are designated granulomatous.[5] Epithelioid cells and giant cells are not histologic features of pyogenic granulomas. The latter term is, therefore, a misnomer.

Pyogenic granuloma is a polypoid form of capillary hemangioma. The tumors may appear on either cutaneous or mucosal surfaces. In a review

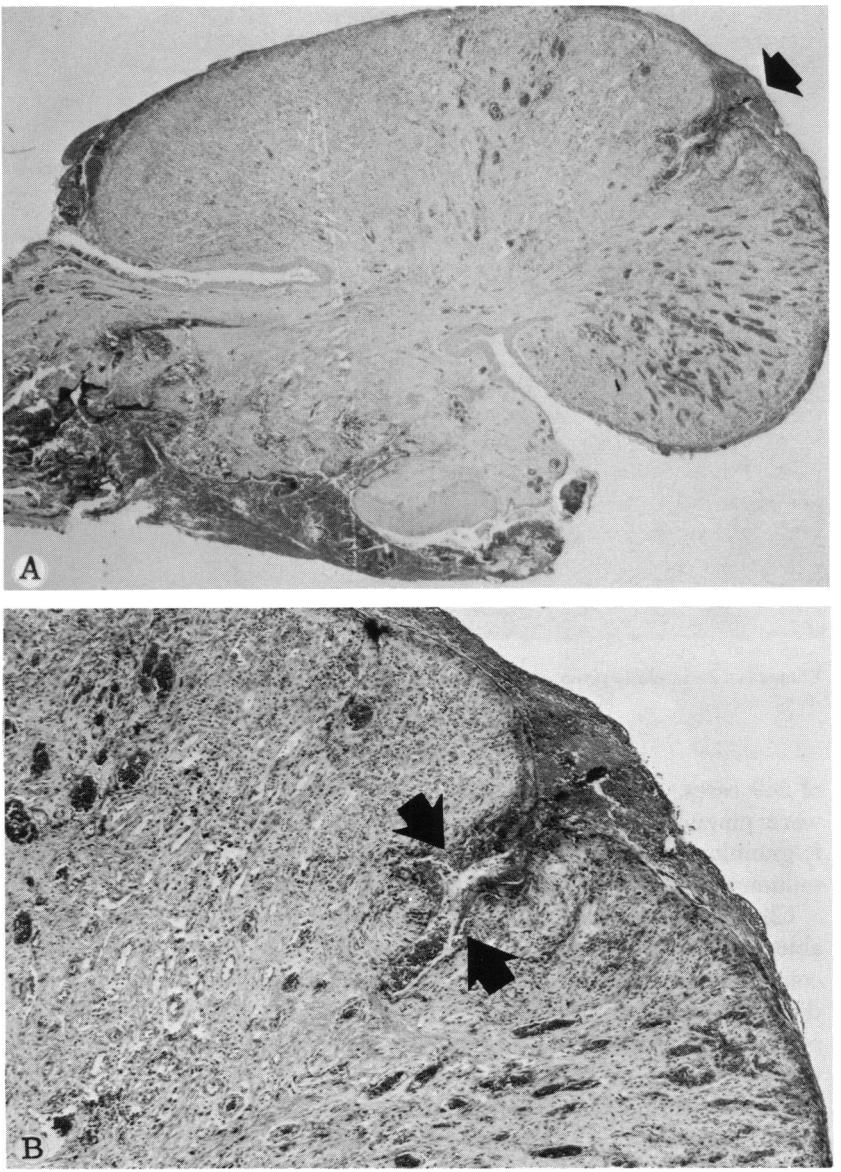

FIGURE 6

Pyogenic granuloma consequent to excision of pinguecula. A: The epithelium of this polypoid, mushroom-shaped lesion is ulcerated. Bleeding from the site signified by *arrowhead* was a distressing clinical feature (H&E; magnification, ×25). B: The bleeding arose from rupture of a large, thin-walled blood vessel (*arrowheads*). Extravasated blood covers the ulcerated dome of the pyogenic granuloma (H&E; magnification, ×50).

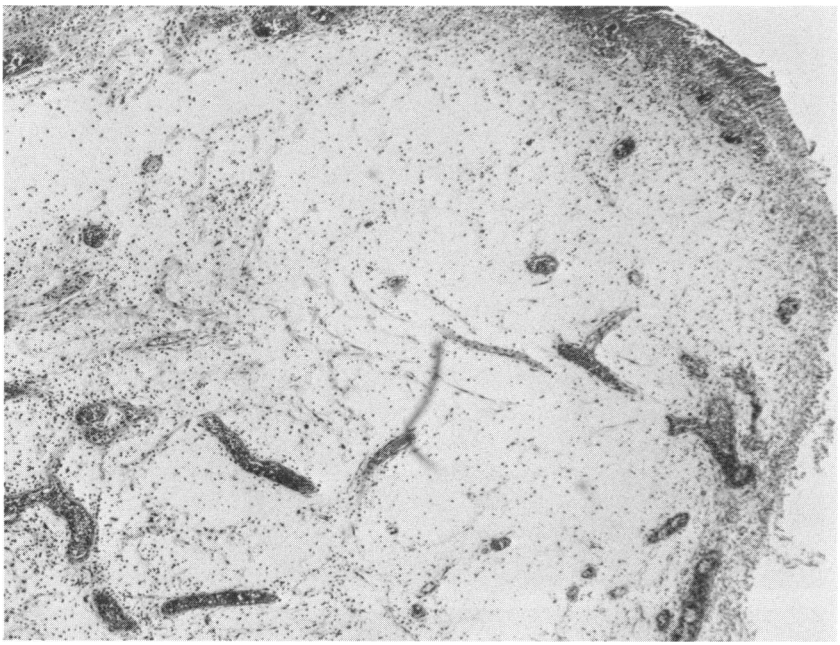

FIGURE 7
Edema is a particularly prominent feature of this pyogenic granuloma (H&E; magnification, ×44).

of 289 cases, the most common sites in descending order of frequency were: gingiva (64), finger (44), lips (40), face (28), and tongue (20). Pyogenic granulomas develop rapidly and achieve their maximal size of several millimeters to a centimeter or more within a few weeks.

Clinically, the well established pyogenic granuloma is a polypoid, friable, purple-red, smooth-surfaced mass that bleeds easily and often becomes ulcerated (Fig 6). In the series I am reporting, bleeding was a disturbing clinical feature in several cases and dominated the clinical picture in two patients. The lesions are usually painless but may be tender.

On histopathological examination the basic lesion is a lobulated cellular hemangioma set in a fibromyxoid matrix. Each lobule of the hemangioma consists of a larger vessel, often with a muscular wall, surrounded by congeries of small capillaries.[4] Stromal edema is usually prominent (Fig 7). Mitotic activity in endothelial cells and fibroblasts may be conspicuous. Most pyogenic granulomas are altered by secondary inflammatory changes. Both acute and chronic inflammatory cells (predominantly neu-

trophils, lymphocytes, and plasma cells) are scattered throughout the lesion, particularly in its superficial layers. Secondarily invading microorganisms are occasionally present in the superficial aspects of ulcerated lesions. Bacteria were readily demonstrable in several of the cases I am presenting today, particularly in those pyogenic granulomas that developed in response to plastic setons used for scleral buckling (Fig 8).

Appropriate clinical management of patients who have pyogenic granulomas begins with recognition of the lesion. In the 100 cases I am presenting today, the ophthalmologist made the correct diagnosis in only 42% of the cases. And in the 18 cases of pyogenic granuloma that followed retinal detachment surgery and strabismus surgery, the clinician made the correct diagnosis in only three instances. Generally, little harm results from the clinician's failure to make the correct diagnosis. But there have been cases in which such a diagnostic error had grave consequences. For example, while I was a trainee at the Armed Forces Institute of Pathology under Lorenz Zimmerman, we[7] reported a case of an elderly man who had undergone excision of a low grade squamous cell carcinoma of the limbus. A mass developed at the excision site and gradually increased in size. In the mistaken belief that the mass was a fulminating recurrence of the squamous cell carcinoma, the ophthalmologist enucleated the eye 6 weeks after the limbal carcinoma had been excised. On histopathologic examination the lesion was simply a pyogenic granuloma.

A detailed discussion of the management of pyogenic granuloma is beyond the scope of this paper. The approach must be individualized for each patient. Although simple excision is effective, this may require general anesthesia in the case of a child. Knowing that many of these lesions involute spontaneously, or heal with a small focal scar, a pediatric ophthalmologist might opt to observe the lesion or to treat it with topical corticosteroids, although the latter are not innocuous agents when used in children. Conversely, an adult who develops a pyogenic granuloma would require only local anesthesia to facilitate immediate removal of the lesion.

The fact that only 3% of the pyogenic granulomas in the series I am reporting recurred attests to the efficacy of simple excision in the vast majority of cases. And "simple" is a key word here. The treatment described by Duke-Elder and MacFaul[3] seems unnecessarily heroic: "Treatment has generally been by a radical excision followed by cauterization of the base as with the silver nitrate stick or fulguration by diathermy; clipping off merely invites a prompt return and is invariably accompanied by severe haemorrhage."

But bleeding at the excision site was seldom a difficulty in the operating room in the cases I am reporting, and was never a problem later in the

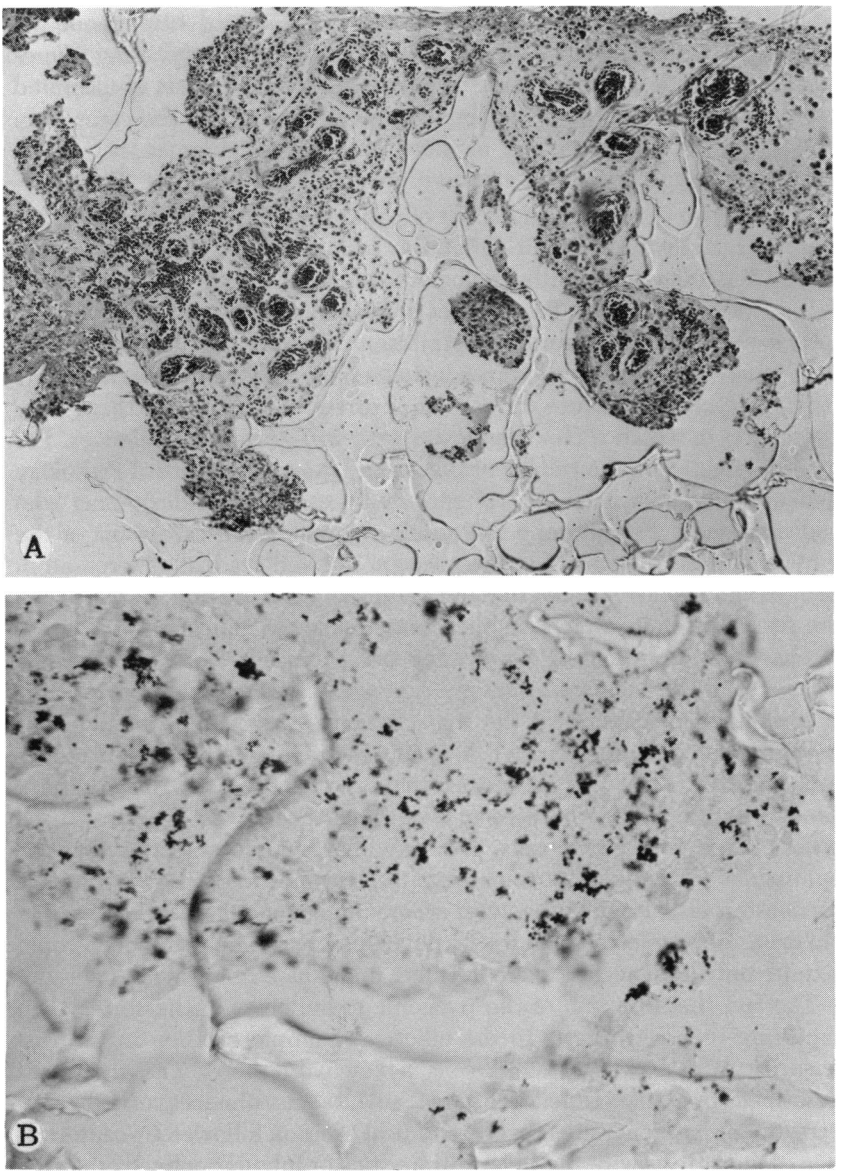

FIGURE 8

Pyogenic granuloma consequent to retinal detachment surgery. A: A pyogenic granuloma surmounts a plastic seton that had been sutured to the sclera to effect scleral buckling. The silicone implant became partially exposed through the conjunctiva (H&E; magnification, ×100). B: A Brown-Brenn stain for bacteria demonstrates the presence of secondarily invading organisms (*Staphylococcus albus*) in the lesion (Brown-Brenn; magnification, ×400).

postoperative course. Most of the surgeons employed only routine hemostasis; cautery was used in a small minority of cases.

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DISCUSSION

Dr Abbot G. Spaulding. One year ago in May, at the 124th Annual Meeting, Doctor Andrew Ferry arose to discuss the paper, "A Re-Evaluation of Corneal Development" authored by Doctors David Sevel and Rob Isaacs. The discussion was initiated by confronting and confusing the erudite and the not so erudite members of the Society. Doctor Ferry raised the question regarding the proper appellation for the individual selected to open the discussion of a paper. Words such as *discussant, discusser, discussionist,* and *discussor* were put forth. Doctor Ferry elaborated further with three revelations: the current terminology, *discussant,* evolved sometime between the 1974 and 1975 meeting; not everybody in Baltimore was pleased with the terminology; and the terminology derived from a Latin root word meaning "*to shake to pieces*." Closing his discussion, Doctor Ferry, being a Virginian and an adherent of Jeffersonian philosophy, asked to be called a *deliberant*. These thoughts have smoldered for a year and the time is ripe to rekindle the controversy by asking Doctor Ferry and others who initiate discussions to call themselves *embellishers*. These *embellishers* would develop, elaborate, and refine the paper being presented, and would not embellish in the other sense: adding ornamental detail, or falsifying and distorting material to increase attractiveness.

The ability of Doctor Ferry to take the mundane and well-understood aspects of ophthalmology and cast them in new and more revealing light is an enviable trait. The present paper is no exception. Pyogenic granuloma, a mass of highly vascularized granulation tissue frequently infected and most often produced by insignificant trauma, seldom is heralded on the front page of the leading journals and yet is very much a part of everyday ophthalmology. Doctor Ferry has done an excellent job in re-examining and re-grouping material collected in the eye pathology laboratory at the Medical College of Virginia. He did this so that all of us might better understand the events and factors that lead to formation of

pyogenic granuloma; so that all of us could restudy the histopathology of this entity; and finally that all of us might broaden our diagnostic acumen to consider this pathological process in atypical situations.

For the clinical ophthalmologist, and for that matter, the ophthalmic pathologist, the impression has been that a definite relationship does exist between chalazion and pyogenic granuloma. In this series under discussion, more than 40% of pyogenic granuloma are associated with chalazion. Some of these chalazia had been operated on, most of them had not. Although clinicians probably would suspect an even higher degree of association, the relationship was misdiagnosed in 25% of the cases.

Another 40% of pyogenic granulomas are induced by surgery. Retinal detachment surgery produced the highest percentage (25%). The next three categories were strabismus surgery, plastic surgery of the lids, and pterygium-pinguecula surgery. Each one of these accounted for 20% of this surgical group. An unexpected 10% can be found following nasolacrimal surgery. Interestingly, a misdiagnosis was made in 80% of the cases by retinal surgeons, and in 75% of the cases by strabismus surgeons.

With such a low level of clinical suspicion, it is not surprising that overall in this study, the diagnosis was incorrect in 50% of the cases.

A short review of the last 60 cases in the eye pathology laboratory at the University of Cincinnati revealed very similar numbers and relationships to those found in Doctor Ferry's study. The mean age and the sex distribution were similar (Table I). The strong relationship between chalazion and pyogenic granuloma was also noted (Table II).

TABLE I: AGE AND SEX DISTRIBUTION IN 60 CASES OF PYOGENIC GRANULOMA

Maximum patient age	86
Minimum patient age	4
Mean patient age	36
Standard deviation	20
No. of males	37
No. of females	23
Total	60

TABLE II: ASSOCIATED FACTORS IN 60 CASES OF PYOGENIC GRANULOMA

Chalazion	22
Ocular/adnexal surgery	11
Trauma	3
Unknown	24
Total	60

If material from one laboratory supports material from another, acceptance of the findings and conclusion would appear to be in order.

Doctor Ferry should be congratulated for a fine paper.

Embellishment remains the last item in this discussion. I would like to present to you three interesting cases of pyogenic granuloma.

The first case concerns itself with a 59-year-old white woman with severe rheumatoid arthritis. She presented herself to the office with a chief complaint of "scum" over the right eye. The external examination revealed a small, white, flat lesion extending out from beneath the right upper lid. From this small tongue of tissue, mucinous debris floated down across the cornea. Eversion of the upper lid revealed a larger pink lesion attached to the conjunctiva and tarsal plate by a small stalk. This was excised and submitted for histopathologic study. The gross dimensions were 15 × 9 × 3 mm and the microscopic diagnosis was pyogenic granuloma. Postoperatively, the involved area healed well. This is the classic presentation of pyogenic granuloma. Generated on the undersurface of the lid, the lesion often acquires considerable size before manifesting clinically. Incidentally, this was the first case of pyogenic granuloma encountered by me upon entering the private practice of medicine.

The second case concerns itself with a 53-year-old white man who noted a gradually enlarging growth on his left cornea of 3 months' duration. He sought attention and the lesion was removed. Ten years previously he had had a conjunctival-corneal mass removed that was diagnosed as squamous cell carcinoma. The material submitted to the laboratory was irregularly shaped conjunctiva and superficial cornea, measuring 13 × 8 × 2 mm, and was diagnosed as pyogenic granuloma. This case illustrates an unusual site for presentation and stresses the importance of considering a commonplace entity when confronted with a diagnostic problem.

The third case involves a 28-year-old black woman seen in consultation by an ophthalmic plastic surgeon for epiphora of the right eye. Examination and irrigation revealed a "ball valve" defect and the insertion of a "Quickert tube" was recommended. Four months later the patient was seen again in consultation for recurrent epiphora. She volunteered a 3 month history of pain and discharge from the right eye. The clinical examination revealed a papillomatous growth extending from the inferior punctum. The growth was excised; a polyethylene tube was removed; and irrigation and expression yielded 4 to 5 small, hard bodies. The pathology laboratory received a 7 × 3.5 × 2.5 mm piece of soft, white tissue and several hard, white-tan masses, the largest of which measured 3 × 2.5 × 2 mm. The microscopic diagnosis was pyogenic granuloma of the right inferior punctum and inferior canaliculus. The dacryoliths were amorphous eosinophilic concretions incorporating inflammatory cells and proliferating fungus and granules. This actinomyces infestation showed organized colonies composed of densely tangled filaments 1 μ or less in diameter. The final case emphasizes again an unusual presentation and underlines the importance of suspecting this lesion when dealing with infection and insignificant trauma.

Thank you for your attention.

DR FREDERICK A. JAKOBIEC. Doctor Spaulding used the phrase "vascularized granulation tissue," and I would like to ask Doctor Ferry if in his opinion this phrase is indeed not redundant. Granulation tissue according to my understanding always is predominantly composed of immature and proliferating vascular/endothelial tissue.

I would like to query Doctor Ferry as to whether he recognizes an entity of immature reactive or reparative connective tissue that is poorly vascularized and in which the predominant element is a proliferating immature fibroblast. If this lesion occurs on the epibulbar surface, one might call it a "Tenonoma." Such a lesion might occupy one part of the spectrum of pseudosarcomatous fascitis. In his review of his case material, did Doctor Ferry find any such immature reactive fibroblastic proliferations that were pauci-vascularized?

DR TAYLOR ASBURY. I cannot help but comment at this historic meeting about the use of the words discussor and discussant just referred to by my Cincinnati colleague, Abbot Spaulding, who gave us such an excellent discussion. When I was Program Chairman in the mid 1970s, the term discussor had been in use. Somehow this did not seem correct, and I was unable to find it in either Webster or Funk and Wagnalls.

The word discussant is found in both dictionaries and is defined as "one who takes part in a discussion." It is obviously the proper word and I hope it will continue to be used in the program and in the Transactions of the AOS instead of the non-word, discussor. Thank you for allowing me to indulge a pet peeve and hopefully perpetuate a bit of erudition for the Society at this Anniversary Meeting.

DR DAVID G. COGAN. I would like to ask the essayist if the granulomas might be an anomalous reaction to aberrant meibomian secretion such as occurs with chalazia?

DR ANDREW P. FERRY. I thank all of the discussers for their comments. Doctor Cogan, I really can't relate pyogenic granulomas to ligneous conjunctivitis, either pathologically or in the clinical behavior of the lesions. And pyogenic granulomas are remarkably easy to treat, simple excision sufficing in virtually every case. Conversely, the dense, woody lesions of ligneous conjunctivitis are more difficult to remove and tend to recur.

Doctor Jakobiec commented about the inherent vascularity of pyogenic granulomas. These lesions are classified as acquired hemangiomas. I don't think I have anything worthwhile to say in response to his question about the possibility of pyogenic granulomas being related to pseudosarcomatous fasciitis (nodular fasciitis). But it is of interest that I sent in consultation to Doctor Ramon Font sections prepared from one of the lesions that arose in the conjunctiva because of my concern that it might be a case of nodular fasciitis. Proliferation of fibrous tissue is a prominent feature in many pyogenic granulomas, and mitotic activity in fibroblasts may be conspicuous.

I *will* say that I was greatly relieved by one aspect of Doctor Spaulding's discussion. Knowing of his close association with Doctor Taylor Asbury, and being aware of Doctor Asbury's interest in raising racehorses, I was afraid that Doctor Spaulding or Doctor Asbury might show us a clinical photograph of "champignons de castration du cheval," as described by Poncet and Dor at the turn of the century!