ORIGINAL ARTICLE

Twenty year review of histopathological findings in enucleated/eviscerated eyes

M U Saeed, B Y P Chang, M Khandwala, A G Shivane, A Chakrabarty

J Clin Pathol 2006;**59**:153–155. doi: 10.1136/jcp.2005.029744

See end of article for authors' affiliations

Correspondence to:
Mr B Y P Chang,
Department of
Ophthalmology,
Clarendon Wing, Leeds
General Infirmary, Leeds
LS2 9NS, UK; bypchang@doctors.org.uk

Accepted for publication
28 May 2005

Background/Aims: To evaluate the need for routine histopathological analysis of enucleated/eviscerated eyes and changes in indications for eye removal.

Methods: Retrospective review of all enucleation/evisceration histopathology reports over 20 years. Clinical history was correlated with pathological findings. Two 10 year periods (1984–93, 1994–2003) were compared to detect changes in indications for eye removal.

Results: In total, 285 histopathology results were traced from 1984 to 2003; 161 and 124 were evisceration and enucleation specimens, respectively. Glaucoma, malignant melanoma, trauma, and retinal detachment were the most frequent diagnoses 1984–1993. Ocular trauma was the most frequent diagnosis 1994–2003, followed by phthisis bulbi and endophthalmitis. Three cases were diagnosed as metastatic carcinoma; all were suspected preoperatively. A fourth case was a diagnostic surprise: adenocarcinoma found in an eye removed for pain and phthisis. Comparison of two 10 year periods showed a decrease in the number of enucleations/eviscerations, perhaps reflecting a decrease in the number of specimens sent. A preference for eviscerations was evident over the 20 years.

Conclusion: The number of eyes removed and histologically analysed decreased in the period 1994 to 2003, perhaps because of better treatment options, allowing globe preservation. There was a significant shift in the diagnosis in the two time periods, and a preference for evisceration in both. Only one diagnostic surprise was discovered (0.35%). This study does not support the need to send all globes/contents for histopathological examination. However, because of the one unexpected finding, it is recommended where the examination is incomplete or the history of visual loss is unclear.

This study was undertaken to evaluate possible changes in the aetiology and frequency of bulbar eviscerations or enucleations and the need for routine histopathological analysis of enucleated and eviscerated eyes.

METHODS

A retrospective review of all enucleation and evisceration histopathology reports over a 20 year period (1984 to 2003) was carried out. Clinical history, where provided, was correlated with the pathological findings. Unexpected and histological surprises were investigated further by reviewing complete patient notes. Two 10 year periods (1984–1993 and 1994–2003) were then compared to look for any changes in indications and numbers of each procedure. Electronic data were retrieved from the hospital coding department for comparison of the number of procedures done versus the number of samples processed.

RESULTS

In total, 285 histopathology results were traced from the 1984–2003 period. One hundred and sixty one were evisceration specimens and 124 were enucleation specimens.

The most common histopathological diagnosis was recent or remote trauma, which was seen in 21.4% of cases (21 enucleation and 41 evisceration specimens). This diagnosis was followed by glaucoma, malignant melanoma, phthisis bulbi, and retinal detachment in decreasing frequency over the 20 year period (table 1).

Glaucoma was the most frequent diagnosis in the 1984–1993 period. However, ocular trauma was most frequent between 1994 and 2003 (table 2).

Table 1 Frequency of different histological diagnoses over the 20 year period (1984–2003)

No. of histological diagnoses	Diagnosis
62	Trauma
46	Glaucoma
43	Malignant melanoma
28	Phthisis bulbi
27	Retinal detachment
16	Endophthalmitis
9	Chronic inflammation
8	Haemorrhage
6	Retinoblastoma
4	Atrophy
4	Diabetic retinopathy
4	Metastatic carcinoma
3	Coates disease
3	Congenital glaucoma
4	Corneal ulcer perforation
2	Sympathetic uveitis
3	Previous ocular surgery
1	Failed corneal graft
1	Fungal infection
1	Goltz syndrome
1	Infarction
1	Microphthalmia
1	Morphologic abnormality
1	Persistent hyperplastic primary vitreous
1	Rheumatoid arthritis
1	Ruptured globe
1	Scarring
1	Amelanotic melanoma
1	Toxocara inflammation
1	Toxoplasma inflammation

Table 2 Breakdown of histological diagnoses during the 10 year periods, 1984–1993 and 1994–2003

Diagnosis	Diagnoses 1984–93	Diagnosis	Diagnoses 1994–2003
Glaucoma	36	Trauma	34
Malignant melanoma	33	Phthisis bulbi	19
Trauma	28	Endophthalmitis	13
Retinal detachment	23	Malignant melanoma	10
Phthisis bulb	9	Glaucoma	10
Haemorrhage	5	Inflammation	7
Diabetic retinopathy	4	Retinal detachment	4
Retinoblastoma	4	Metastatic carcinoma	3
Atrophy	3	Congenital glaucoma	3
	3	Morphological abnormality	3
Endophthalmitis		Coates disease	2
Inflammation	4		2
Previous ocular surgery	3	Haemorrhage	
Coates disease	1	Retinoblastoma	2
Corneal ulcer	1	Atrophy	1
Infarction	1	Corneal ulcer	1
Metastatic carcinoma	1	Failed corneal graft	1
Morphological abnormality	1		1
Ruptured globe	2	Fungal infection	
Sympathetic uveitis	1	Perforation	1
Toxoplasma uveitis	1	Scarring	1
		Amelanotic melanoma	1
		Sympathetic uveitis	1
		Toxocara inflammation	1

Three eyes (1.05%) were diagnosed with metastatic carcinoma. These were suspected preoperatively. Another case was a diagnostic surprise (0.35%); this was an adenocarcinoma found in an eye removed for pain and phthisis.

Twenty eight eyes removed with a history of phthisis bulbi were sent for histology (22 evisceration specimens and six enucleated globes). The diagnosis of phthisis bulbi was reconfirmed in 27 cases.

Endophthalmitis was the final diagnosis rendered in 16 eyes (15 eviscerations and one enucleation) over the above mentioned 20 year period. One enucleation and two evisceration specimens were confirmed as endophthalmitis between 1984 and 1993. Thirteen evisceration specimens were diagnosed as endophthalmitis during 1994 to 2003. At least two of these were postoperative, one was secondary to bleb infection, two as a result of perforating injuries, and two secondary to microbial keratitis. The rest were not further specified.

Forty six eyes were removed with a histological diagnosis of glaucoma over the 20 year period (31 eviscerations and 15 enucleations). Of these, 36 were during the 1984 to 1993 period and 10 during 1994 to 2003. Neovascular features with various causes were prominent in this subgroup.

Comparison of the two 10 year periods shows a decrease in the number of enucleations and a preference for scleral preservation. It also showed a decrease in the number of enucleations and eviscerations. A preference for eviscerations was evident. Between 1984 and 1993, 166 eyes removed were sent for histology. Ninety two (55.42%) were eviscerations and 74 were enucleations (44.57%). Between 1994 and 2003, 119 specimens were processed. Of these, 68 (57.1%) were eviscerations and 51 (42.8%) were enucleations. When cases with intraocular tumours were excluded, eviscerations were prominent (66% between 1994 and 2003 compared with 71% between 1984 and 1993).

Data retrieved from the hospitals' coding departments (St James University Hospital and Leeds General Infirmary) show that 43.6% of the eyes removed were sent for histopathology.

DISCUSSION

Evisceration is becoming the preferred technique for removal of the eye for various indications.¹ These include endophthalmitis, trauma, painful blind eyes, etc. Advantages of evisceration over enucleation include relative preservation of tissue, better cosmetic result, superior mobility for the future prosthesis, and lower risk of intracranial infection or extrusion of orbital implant.² However, Levine *et al* suggest a slightly higher rate of sympathetic uveitis in patients undergoing an evisceration.³

Our retrospective study shows a decrease in the number of procedures to remove the eye in the 10 year period 1994–2003. This may be indicative of a trend towards globe preservation procedures; that is, globe repair versus primary evisceration in trauma, etc. Our data also show a significant shift in the indications of removal of ocular tissue. Glaucoma, choroidal melanomas, trauma, and retinal detachment were the most frequent histopathological diagnoses between 1984 and 1993. Trauma was the most frequent diagnosis, followed by phthisis bulbi and endophthalmitis during 1994 to 2003 (table 2).

Our data show a preference for evisceration in both 10 year periods. However, the proportion of eviscerations did not increase. This was unexpected because recent studies report an increasing trend in favour of eviscerations.⁴

Our data indicate that histological examination of enucleated or eviscerated eyes with a clear history of trauma, penetrating, or perforating eye injury revealed no surprises. In cases of civil trauma it may be necessary to have documented evidence that the eye was irretrievable for medicolegal purposes.

“Advantages of evisceration over enucleation include relative preservation of tissue, better cosmetic result, superior mobility for the future prosthesis, and lower risk of intracranial infection or extrusion of orbital implant”

Histology is essential if there is a suspicion of an intraocular tumour from history or examination. These cases are likely to benefit from enucleation rather than evisceration. Our study showed only one surprise (0.35%) diagnosis of a presumed secondary adenocarcinoma from an unknown primary. This was a case where posterior pole view could not be obtained in a painful pthysical eye and ultrasound was not felt to be helpful in the diagnosis.

Our data indicate a decrease in the number of globes eviscerated or enucleated with a histopathological diagnosis of glaucoma during the past 10 years. This is probably because of better management of glaucoma in general and neovascular glaucoma in particular.⁵ Our data also indicate a similar decline of globe removal as a result of ocular complications of failed retinal detachment repair. Vitrectomy, heavy liquids, intraocular gases, lasers, and other advances in retinal detachment surgery probably mean that fewer eyes need to be removed with a diagnosis of complicated total retinal detachment.

The decrease in the number of eyes removed with a diagnosis of choroidal melanoma from this hospital is presumably the result of referral to a regional tertiary centre, where alternative treatment options are available.

Our data indicate that 43% of surgically removed globes and ocular contents are sent for pathological investigation. Presumably, decisions to send are made on a case to case basis and commonsense, rather than a blanket policy. Our study showed a diagnostic surprise in 0.35% of cases. Therefore, routine histopathological examination of all specimens cannot be recommended. The absolute indications for specimen submission would be in known or suspected ocular tumours.

Take home messages

- We reviewed all enucleation and evisceration histopathology reports over the past 20 years and found that the number of eyes removed and histologically analysed decreased in the period 1994 to 2003, perhaps because of better treatment options, allowing globe preservation
- There was a significant shift in the diagnosis in the two time periods, and a preference for evisceration in both
- Only one diagnostic surprise was discovered, so that this study does not support the need to send all globes/contents for histopathological examination
- We recommend that histopathological examination should be undertaken when the history, examination, or surgical findings are unclear or unaccounted for

A reduction in routine specimen submission may have an adverse impact on training in ocular pathology. This may reduce the likelihood of replacing any of the currently small number of ophthalmic pathologists with an appropriately trained person.

The national specialist ophthalmic pathology service recognises that there is insufficient specialist ophthalmology reporting capacity in the UK.⁶ It advises ophthalmologists to retain current pathology specimen referral practices.⁶ Until the time that all hospitals have specialist ophthalmic pathology cover, a commonsense approach with respect to pathology specimens will be needed.

In conclusion, our study shows that all globes and ocular tissue are not currently sent for a pathological examination. For example, eyes with a clear history and examination pointing to a non-malignant aetiology, trauma, or neovascular glaucoma do not need routine histopathological

analysis. However, eyes lost as a result of recent trauma may require a histological examination for medicolegal reasons. Pathological analysis does provide absolute confirmation of the pathological processes inside the eye removed. It also allows for pathologists to maintain ocular diagnostic skills. In eyes with unexpected or unexplained findings on clinical examination and where examination may not be complete (opaque ocular media), the information from a pathological report may be extremely valuable. When the history, examination, or surgical findings are unclear or unaccounted for, we suggest a histological examination.

We would advise efficient use of resources, considering clinical history and examination findings, when sending a specimen for histopathological examination.

Authors' affiliations

M U Saeed, B Y P Chang, M Khandwala, Department of Ophthalmology, Leeds General Infirmary, Clarendon Wing Leeds LS2 9NS, UK

A G Shivane, A Chakrabarty, Department of Histopathology, Leeds General Infirmary, Algernon Firth Building, Great George Street, Leeds LS1 3EX, UK

REFERENCES

- 1 **Dortzbach RK**, Woog JJ. Choice of procedure. Enucleation, evisceration, or prosthetic fitting over globes. *Ophthalmology* 1985;**92**:1249–55.
- 2 **Hansen AB**, Petersen C, Heegaard S, et al. Review of 1028 bulbar eviscerations and enucleations. Changes in aetiology and frequency over a 20-year period. *Acta Ophthalmol Scand* 1999;**77**:331–5.
- 3 **Levine MR**, Pou CR, Lash RH. The 1998 Wendell Hughes lecture. Evisceration: is sympathetic ophthalmia a concern in the new millennium? *Ophthalm Plast Reconstr Surg* 1999;**15**:4–8.
- 4 **Genevois O**, Millet P, Retout A, et al. Comparison after 10 years of two 100-patient cohorts operated on for eviscerations or enucleations. *Eur J Ophthalmol* 2004;**14**:363–8.
- 5 **de Gottrau P**, Holbach LM, Naumann GO. Clinicopathological review of 1146 enucleations (1980–90). *Br J Ophthalmol* 1994;**78**:260–5.
- 6 **Parsons MA**. Funding of the national specialist ophthalmic pathology service. *College News Royal College of Ophthalmologists* 2005;1:3.