



Gill Adams

Devon Schuyler

PHYSICIANS must be cautious in viewing eye exams as a reliable way to prove or disprove child abuse, a recent study suggests.

"Some people believe in the specificity of retinal haemorrhages to the point that it has almost become a cult. Having retinal haemorrhages is not diagnostic of abuse, any more than the absence of retinal haemorrhage proves that a child was not abused," Patrick E Lantz MD, a forensic pathologist at Wake Forest University Baptist Medical Center in North Carolina, told *EuroTimes*.

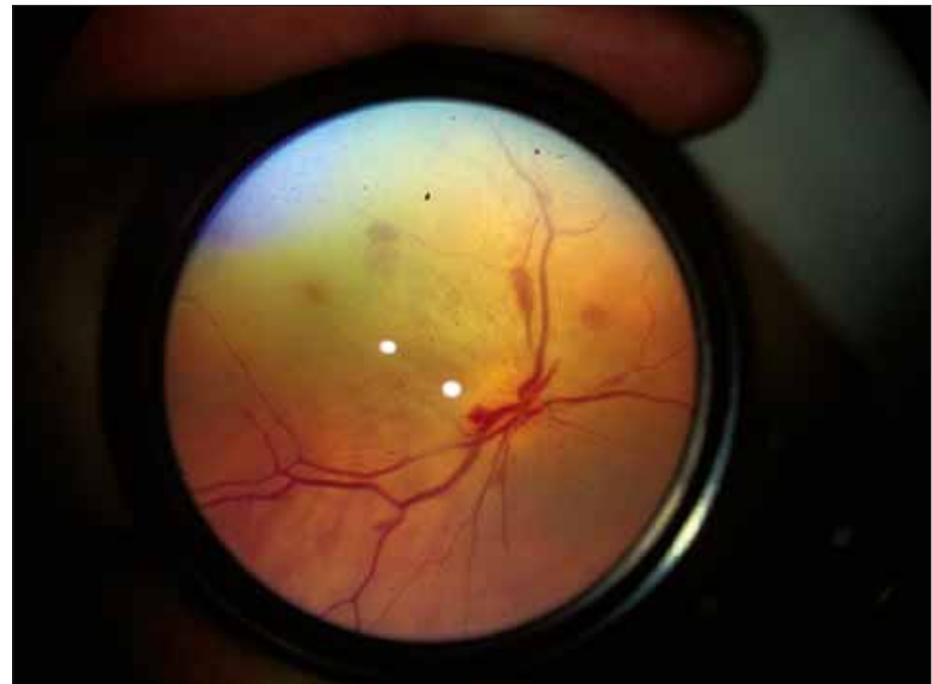
In a recent study, Dr Lantz and colleague Constance A Stanton MD, a neuropathologist, found that the number of non-abuse cases with retinal haemorrhages actually outnumbers the ones with abuse. The study involved examining the eyes of 700 deceased individuals, ranging in age from newborn to 96 years of age, between June 2004 and January 2006. He presented their results at the 58th annual meeting of the American Academy of Forensic Sciences in Seattle.

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Retinal haemorrhages were present in 111 people (16%) including 30 children under age 14, but only six of these cases were associated with child abuse. For example, there were three children aged one to four years who had retinal haemorrhages; two had been abused and one had been killed in a motor vehicle accident. There were 19 children less than one year of age with retinal haemorrhages; four of these had been abused. The other infants with retinal haemorrhages died from or had conditions such as congenital heart disease, intracranial haemorrhage,



The technique of postmortem monocular indirect ophthalmoscopy permits visualisation of the fundus after death by using an aspheric condensing lens and an inexpensive headlamp



Aerial image of a fundus with retinal haemorrhages obtained by postmortem monocular indirect ophthalmoscopy

Courtesy of Patrick E Lantz MD

overlying bronchiolitis, congenital infections, congenital anomalies, and resuscitation for sudden infant death syndrome.

"This is a very interesting study, which I suspect is the first of its kind to report this data," said Gill Adams FRCS(Ed), a consultant ophthalmic surgeon at Moorfields Eye Hospital, in an interview with *EuroTimes*. (Dr Adams collaborated with Dr Lantz on the eye examination technique that they published last year, see below). She said that the study was somewhat limited by the small number of young children, but said that she would like to see the data published so the results can reach a wider audience.

SEEING inside the eyes of the dead

Before Dr Lantz could conduct his study, he needed to develop a good way to examine the retina. Examination of the retinas is not routine during autopsy, in part because the traditional exam involves removing the eyes – something that is not part of the standard post mortem procedure.

Dr Lantz wanted a simpler method that would allow him to visualise the back of the eye through the corneal clouding and swelling that occurs after death. He adapted a clinical technique called monocular indirect ophthalmoscopy, which requires only an indirect condensing lens and an inexpensive headlamp.

"Using this technique, I can look at the fundus after death and get a very good sweeping panoramic view of all four

quadrants in less than a minute," he said.

He published his technique in the *Journal of Forensic Sciences* (November 2005;50:1450-1452).

A tragic accident

Dr Lantz first became interested in the relationship between eye injuries and child abuse in 2001, after a 14-month-old boy died at his medical centre after a falling television struck the child's head while his father was in another room.

"Everyone thought it was an accident," said Dr Lantz, including the emergency staff, the paediatric child abuse specialist, paediatric intensive care doctors and the police. That changed, however, after a paediatric ophthalmologist examined the boy.

"He saw the retinal haemorrhages and perimacular retinal folds, and he said, 'Well, the only way these folds can come about is through shaking.'" This led to Child Protective Services removing the dead boy's older brother from his home.

Dr Lantz and his colleagues went so far as to re-enact how the television set would have fallen from its homemade stand.

"Everything was consistent with an accident except for this eye finding," he said.

When they began to examine the literature for evidence that shaking was the sole cause of perimacular retinal folds in young children, they found only poorly designed studies without a suitable control group.

"Some of these studies actually used the presence of retinal haemorrhages to classify abuse," he said. Dr Lantz published an account of the case, along with a report on the shakiness of the literature, in *BMJ* (March 27, 2004;328:754-756).

"The problem is if abuse is suspected, almost all of the children have their eyes examined. If abuse is not suspected, nobody looks in the back of the eyes."

NO easy answers

Dr Lantz said that some physicians are under the impression that even if retinal haemorrhages in general are not diagnostic of child abuse, certain types are, such as those that affect all the layers of the eye. But he said that he's seen several cases of retinal haemorrhages from accidents and natural diseases that involved all the layers.

He hypothesised that some people were resistant to changing their beliefs because they "want an easy button" instead of investigating all the facts of an individual case, and admitting that sometimes there's no clear answer.

Dr Lantz said he hopes that his work will cause forensic pathologists, paediatricians and ophthalmologists to stop viewing specific retinal injuries as diagnostic of abuse, and that more people would look for evidence of retinal haemorrhages in other cases of accidents and natural diseases.

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