

Pineal gland cyst-to fight or not to fight?

Abstract

Since professional boxing is associated with substantial risk of both acute and chronic traumatic brain injury, many athletic (boxing) commissions in the United States and abroad request a neuroimaging study of the brain to determine brain fitness to fight. Either magnetic resonance imaging (MRI) brain or computed tomography (CT) head is needed to obtain a license to compete in professional combat sports and periodically thereafter. The neuroimaging study helps to identify and/or exclude structural brain lesions that may pose a risk of rupture or bleeding from head impact exposures (HIEs) sustained during the course of the bout. Identification of structural brain lesions such as large tumors, vascular malformations such as aneurysms, arteriovenous malformations, and large cavernous malformations results in a denial of licensure to fight. Pineal gland cysts (PC) are usually benign cysts discovered on occasions incidentally in MRI scans of boxers. A 25-year-old asymptomatic boxer was found to have a 2 cm PC with intracystic hemorrhage on MRI scan done for licensure. The medical literature was reviewed to determine whether boxers with PC can safely compete in combat sports.

Keywords: Pineal gland, professional boxing, combat sports

Volume 7 Issue 1 - 2024

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Received: April 06, 2024 | **Published:** April 18, 2024

Introduction

Due to paucity of medical literature, it is unclear whether boxers with PC should be allowed to compete professionally. A young asymptomatic boxer was found to have hemorrhage into a large PC. He was denied license to fight and referred to a neurosurgeon for definitive treatment.

Case Report

A 25-year-old amateur male boxer applied for his professional boxing license. As part of the medical requirements for license, MRI brain without contrast was submitted this showed a pineal gland cystic mass measuring up to 2 cm in greatest AP diameter read as possibly a benign cyst. Superior tectal mass effect with at least partial effacement of the cerebral aqueduct was noted without any associated hydrocephalus. To evaluate the pineal cystic lesion in greater detail, MRI brain with contrast was requested which revealed a 2.1x1.1 cm cystic pineal lesion with mass effect on the superior tectum. Fluid hemorrhage level was noted posteriorly in the lesion. There was no hydrocephalus noted and the radiologist recommended interval follow up. The boxer who had been in camp for his upcoming professional debut denied any neurological symptoms. He admitted to actively sparring in preparation for his upcoming bout but denied any significant HIEs or knockouts. He was denied license to compete, advised to stop training and referred to a neurologist for further management.

Discussion

Pineal gland cysts are usually benign cysts frequently found incidentally on MRI brain scans or on autopsy. Usually asymptomatic and small (mean diameter is around 4.3 mm), PC may rarely cause symptoms such as headache, postural syncope, loss of consciousness and in some cases even sudden death. Na et al. reported the case of a 30-year-old woman found unresponsive in a public toilet. On autopsy a PC was found which was considered as the assumed cause of death in the absence of any other cause.¹ Barranco et al., reported the case of an apparently healthy 45-year-old woman who collapsed and died after reaching orgasm during sexual intercourse. Postmortem examination determined the cause of death to be cardiorespiratory

failure due to midbrain compression from PC possibly exacerbated by sudden increase in intracranial pressure due to Valsalva maneuver at the time of climax.²

Small PCs are usually asymptomatic. They need no active intervention and can be safely monitored with serial MRI scans. Large PC (>5mm) are rare findings and at times symptomatic due to mass effect. They may present with signs of raised intracranial pressure such as headache, nausea, vomiting and ataxia if narrowing or obstruction of the cerebral aqueduct occurs. Apoplexy is a rare ill-defined presentation and should be suspected in a patient with known PC who presents with sudden onset severe headache with or without other signs of hydrocephalus. Surgical resection in these cases minimizes the risk of recurrence and complication. In some cases stereotactic aspiration has yielded good results.³

There is paucity of medical literature with respect to incidence of occurrence of PC in healthy young combatants. In most of these athletes, PC is detected incidentally on a neuroimaging study of the brain requested to determine brain fitness to fight. The PC in these cases is invariably small (<5 mm) and asymptomatic. Boxing is a unique sport in that every punch thrown at the head is thrown with the intention of winning by causing a knockout which is nothing but a concussive injury to the brain. As a result HIEs are common in boxing and the sport carries a high risk of both acute and chronic neurological injuries. Apoplexy due to HIE is unlikely in small sized (<5 mm) and asymptomatic PC. So these athletes can be cleared to box. The PC though should be monitored by serial MRI scans carried out initially every year and if stable in size and characteristic every 3-5 years. Large sized pineal cysts are vulnerable to apoplexy. These athletes should be denied license to fight and referred to a neurologist or a neurosurgeon for further evaluation and definitive management.

Conclusion

Combatants with small sized and asymptomatic PCs can be medically cleared to compete in combat and contact sports. Large PCs are at times symptomatic and vulnerable to apoplexy due to HIEs. These athletes should be denied license to fight and referred to a neurologist or a neurosurgeon for further evaluation and definitive management.

Acknowledgments

None.

Conflicts of interest

The author declares that there are no conflicts of interest.

Funding

No targeted funding reported.

References

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