et al 1988). Our two boys have identical genetic composition and, therefore, similar hormonal environments, but it is unlikely that their environment, in terms of hip trauma, has been identical. This case, therefore, supports the concept that individuals are genetically susceptible and that environmental factors play a much smaller role.

The HLA phenotype of the twins was A2, B12. In only one of the other two reported cases was the HLA phenotype described: in that case it was A11, B12 (Gajraj 1986). The significance of the common B12 at this stage is unclear, but further phenotype studies may be warranted.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

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FATAL AIR EMBOLISM DURING ARTHROSCOPY

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Recently, a report of a fatal air embolism was published in the *Journal of Bone and Joint Surgery* (Habegger, Siebenmann and Kieser 1989). It seems possible that this was not an isolated case and that the risk of such an occurrence, especially after a recent injury, is not widely appreciated. I therefore report another such case (Grünwald, Bauer and Wruhs 1987) and note the discussion which followed its presentation at a meeting.

Case report. A girl aged 17 years injured her right knee, sustaining a fracture of the tibial eminence. In order to exclude the possibility that a torn medial meniscus was interposed at the fracture site an arthroscopy was performed, some 36 hours after the injury. The joint was washed out with Ringer's solution, but the affected area could not be seen with sufficient clarity. The joint was therefore insufflated with air, using a device similar to that employed by Habegger et al (1989). Some five minutes later there was cardiac arrest and after 45 minutes of attempted resuscitation the girl died.

At autopsy a massive air embolism was found. There seemed no way in which air could have entered the circulation other than through the fracture site. An attempt was made to simulate the arthroscopic procedure and air was found in the femoral vein.

Discussion. This case was reported at a meeting in Innsbruck, Austria, at which Habegger's case was also presented. In the discussion which followed, four surgeons recalled arthroscopies with a fatal outcome the cause of which was unclear. Two other surgeons reported acute anoxia following arthroscopy of recently injured knees; in each case the insufflation was gaseous, using air or carbon dioxide.

It seems that even when plain radiographs appear normal, there may be a trivial fracture opening into a venous sinus; through this, gas under pressure may enter the venous system. Although carbon dioxide may be tolerated better than air the danger still exists, particularly if a tourniquet is used. A sizeable volume of gas may accumulate in the venous reservoir and, when the tourniquet is released, a lethal bolus may be liberated.

Conclusion. When arthroscopy of a recently injured knee is being performed, gaseous insufflation, whether with air or carbon dioxide exposes the patient to the risk of an air embolism which may prove fatal.

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