Purpose

To study the influence of traction on the blood circulation of femoral head and its evaluation by digital subtraction angiography (DSA)

Methods and Materials

Using micro-catheter, DSA of the femoral circumflex artery (FCA) in 22 healthy dogs was performed in unilateral hip before and immediately during and 30, 60, 90, 120 minutes during continuous 2kg skin traction, and immediately till 60 minutes after removal of traction. Comparative angiography was also performed in the presence of cross traction with 2kg and 4kg before continuous tractions in 12 hips. Blood circulation of the femoral head was evaluated mainly by observing its perfusion and time of circulation. Analysis of variance was employed for statistical analysis.

Results

Traction with 2kg gravity resulted in slow flow rate of contrast media, reduced number of the FCA branches, straightening, thinning and spasm of the vessels, delayed and partly defected perfusion of femoral head, and prolonged time to peak staining and venous return. There was significant in DSA assessment between before and during traction in the same hip ($p=0.000$). When traction was increased to 4kg, or continuous traction lasted longer for 60 minutes, 90 minutes and 120 minutes, circulation disorder of the femoral head especially perfusion defect and prolonged circulation time shown in DSA became more severe and it was more difficult to recover from these state after removal of traction ($p=0.000$). Angiography 30 minutes during 2kg continuous traction showed changes similar to that of immediately after traction, and angiography immediately after removal of traction revealed recanalization of vessels and re-perfusion of the femoral head. There were still spasm in the FCA and perfusion defects in the femoral head 60 minutes after traction removal as continuous traction lasted for 120 minutes.

Conclusion

Traction could lead to ischemic response and circulation disorder of the femoral head. DSA can directly reflect these changes in the femoral head with angioarchitectural and hemodynamic indexes.
References


**Personal Information**

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