# Fourth intraventricular hemorrhage

An analysis of 50 patients with CT-documented fourth IVH treated between 1987 and 1992 is presented. The various etiologies included intraparenchymal hemorrhage with secondary fourth IVH (19 cases), spontaneous subarachnoid hemorrhage (18 cases), spontaneous IVH (seven cases), and trauma (six cases). Overall, 28 patients (56%) had hemorrhagic dilation of the fourth ventricle and all 28 suffered brain death, despite aggressive treatment in 79% of cases. Twenty-two patients (44%) had fourth IVH without dilation; of these, nine (41%) died and 13 (59%) experienced functional survival, despite aggressive care in 90% of cases. The survival rate was significantly worse for patients with dilation of the fourth ventricle ($p < 0.01$, chi-squared test). Of the 28 patients with fourth IVH associated with dilation, 25 (89%) had diffuse clot, involving the lateral and third ventricles as well, and three (11%) had isolated fourth IVH. Of the 22 patients with fourth IVH and no dilation, 13 (59%) had diffuse IVH (eight of these died and five had functional recovery) and nine (41%) had isolated fourth IVH (one died and eight had functional recovery). Diffuse ventricular clot was associated with an increased mortality rate for patients with fourth IVH and no dilation ($p < 0.05$). Of the 28 patients with fourth IVH associated with dilation, 24 (86%) presented with a Glasgow Coma Scale (GCS) score of 3 or 4, one with a GCS score of 6, and three with a GCS score of 13 to 15; all 28 died. For the 22 patients with fourth IVH and no dilation, nine presented with a GCS score of 3 to 5 (eight died and one had functional recovery), three had a GCS score of 6 to 8 (all three had functional survival), two had a GCS score of 9 to 12 (both had functional survival), and eight had a GCS score of 13 to 15 (one died and seven had functional survival). There was a greater chance of higher GCS scores in patients with fourth IVH and no hemorrhagic dilation ($p < 0.01$). Logistic regression multivariate analysis showed hemorrhagic fourth ventricular dilation to be the most significant outcome predictor ($p = 0.0001$), followed by GCS score ($p = 0.007$) and the presence of diffuse IVH ($p = 0.0279$) [1)].

1)
Shapiro SA, Campbell RL, Scully T. Hemorrhagic dilation of the fourth ventricle: an ominous predictor. J Neurosurg. 1994 May;80(5):805-9. doi: 10.3171/jns.1994.80.5.0805. PMID: 8169618.