2. Two patients had amaurosis fugax attacks of the right eye, and five reported brainstem TIAs.

3. Blood pressure was measured bilaterally, with significant differences found in eight patients. In six patients with bilateral subclavian steal, no differences were seen.

4. After surgery, the TIAs stopped.

5. Among the 10 operated patients, seven were symptomatic. Three asymptomatic patients underwent surgery prior to aorto-coronary bypass surgery during the same thoracotomy.

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Reference


Hemorrhagic Transformation of Cardioembolic Stroke

To the Editor:

Two recent reports in *Stroke* provide interesting information and prompt further speculation about hemorrhagic transformation of cardioembolic stroke.1,2 Secondary hemorrhagic transformation of presumed cardioembolic stroke is usually not associated with recognized clinical worsening.3,4 Definition of the temporal window of hemorrhagic transformation has been based on retrospective case series in which computed tomography (CT) data were collected at nonstandard time intervals, perhaps in patients with late hemorrhagic transformation that was undetected and therefore not included.5-7 The single prospective study using serial CTs up to 3 weeks after stroke reported an extraordinarily high prevalence of hemorrhagic infarction (43% of all supratentorial infarcts, 61% of presumed cardioembolic infarcts).8 While initial case collections suggested that the great majority of spontaneous hemorrhagic transformation occurred within 2-4 days of cardioembolic stroke (Figure 1),1,2,5 multiple case reports have since documented later occurrence.6-9 In short, the exact limits of the window of spontaneous secondary hemorrhagic transformation remain ill-defined. There is clearly a delay between stroke onset and the development of hemorrhagic transformation detected by CT. In the CT/autopsy series of Lodder et al, only 10% (2/21) of the infarcts had definitely transformed before 24 hours, and at least 25% and possibly as many as 77% of patients had undergone HT.

The potential safety of acute fibrinolytic therapy in cardioembolic stroke may safely precede the period of hemorrhagic transformation, recanalization may be less frequently achieved in thrombolytic therapy.

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![Figure 1. Timing of hemorrhagic transformation (HT) defined by computed tomography (n=34) or autopsy (n=14) from two combined case series.](image-url)
Hemorrhagic transformation of cardioembolic stroke.

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