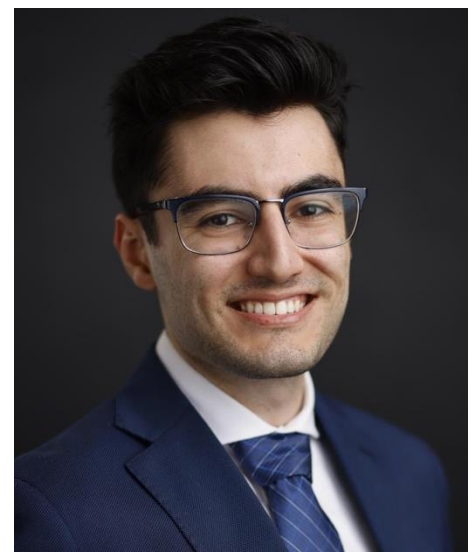


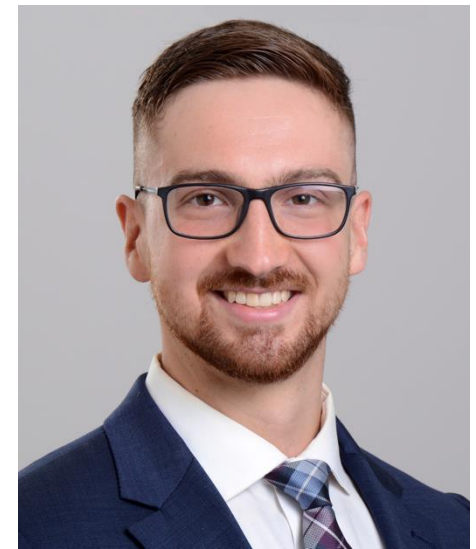
Patient with hypertensive crisis and aortic dissection develops stroke



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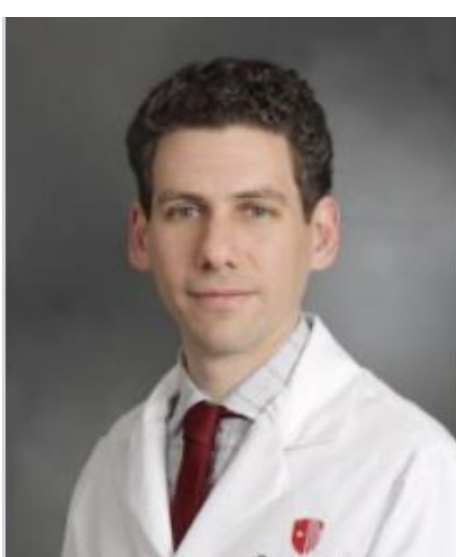
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Introduction:

Hypertensive crisis is a potentially dangerous condition typically defined as a systolic and diastolic blood pressure of greater than 180 mmHg and 120 mmHg, respectively. It can be subdivided into hypertensive emergency or urgency depending on the presence of end-organ damage. Examples of end-organ damage include hypertensive encephalopathy, myocardial infarction, aortic dissection, and acute kidney injury. Thus, timely identification and appropriate management is necessary to prevent long-term complications.

The mainstay of managing hypertensive crises is gradual blood pressure reduction, with a maximum 25% reduction in the first hour, and then a slow reduction to baseline over the next 24-48 hours. A gradual rather than aggressive approach is recommended to prevent ischemia, and complications such as stroke, in areas that are used to chronically elevated pressures.

There are exceptions to this rule, with one being the presence of an aortic dissection. In this case, management typically involves rapid blood pressure reduction and impulse control with beta blockers. The opposing management goals of hypertensive emergency and aortic dissection presents a unique clinical challenge.

A Perfusion Catch 22 – When Does the Aorta Beat The Brain?

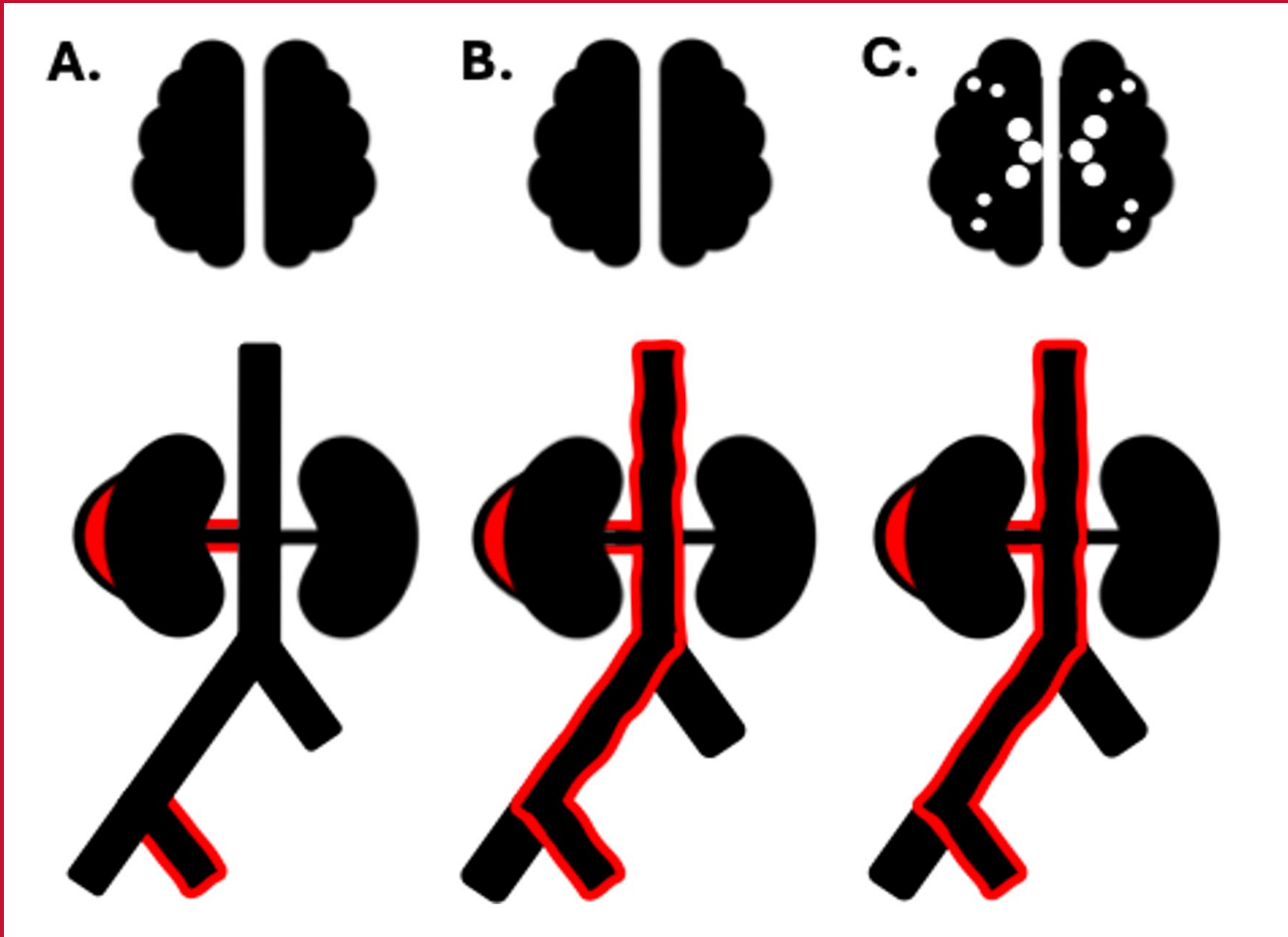


Figure 1. Progression of arterial dissections and cerebrovascular involvement in this hypertensive crisis case. A.) Initial presentation with right renal artery and right external iliac artery dissection and right renal subscapular hematoma. B.) Status post graduated MAP reduction and IR intervention now with worsening of dissection to common iliac and abdominal aorta C.) Status post impulse control now with bilateral watershed infarcts.

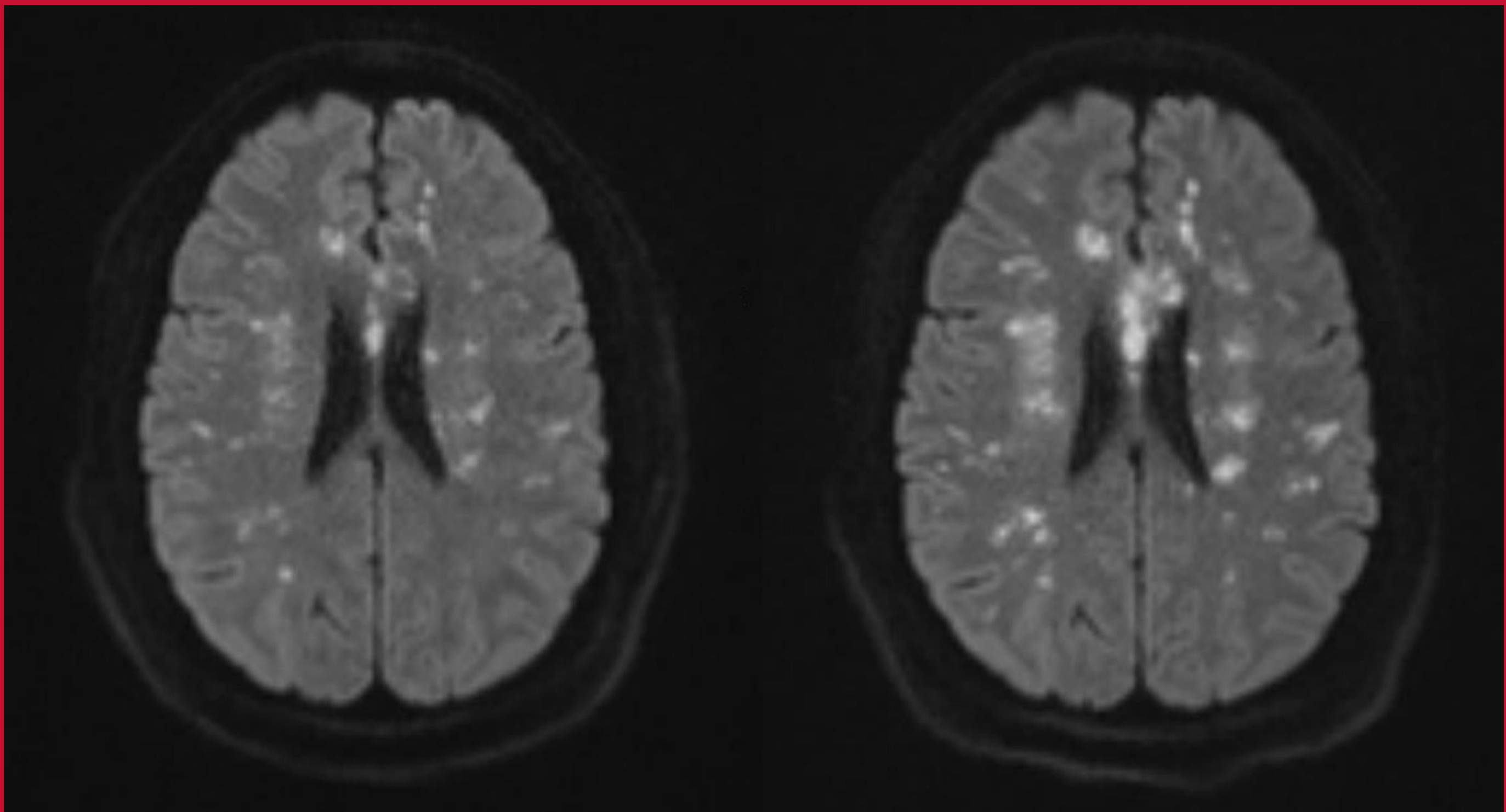


Figure 2: Diffusion-Weighted Image (DWI) Brain MRI demonstrating progression of watershed infarcts over the course of 34 hours.



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Case Presentation:

We present the case of a 49-year-old male with flank pain found to be in hypertensive crisis with a renal artery dissection, subscapular hematoma, and external iliac artery dissection.

During gradual mean arterial pressure (MAP) reduction, he underwent renal artery embolization. Interval CT demonstrated a progressive type B aortic dissection involving the common iliac artery.

Despite achieving impulse control, he developed lethargy with watershed infarcts on MRI. After interdisciplinary consultation with vascular neurology and vascular surgery, hemodynamic goals were liberalized to balance impulse therapy and cerebral perfusion. Over the following months, his neurological function continued to improve, and he was discharged to a rehabilitation facility.

Discussion:

- Hypertensive crisis in the setting of aortic dissection presents a complex clinical dilemma
- Hypertensive emergencies typically require gradual blood pressure reduction to avoid end-organ ischemia while aortic dissection demands rapid blood pressure and impulse control to limit propagation and reduce aortic wall stress
- This case underscores the challenges of navigating such conflicting management strategies
- Patient developed watershed infarcts during aggressive blood pressure control, prompting a shift to more liberal hemodynamic targets
- Dynamic adjustment of goals—guided by neurologic status and imaging—allowed for continued aortic stabilization while preserving cerebral perfusion and ultimately supporting neurologic recovery

Conclusion:

- This case highlights the need for individualized treatment when standard protocol conflicts
- Our experience illustrates the importance of dynamic and interdisciplinary, patient-centered physician-led management in complex vascular emergencies.

References available on request. Scan below to connect with us!

