Background and aims During the course of the pandemic, it became clear that COVID-19 should be regarded as a systemic disease, particularly affecting the coagulation system with a high incidence of arterial thrombotic events (ATE). The aim of this study was to investigate the incidence and characteristics of ATE in hospitalized patients with COVID-19 using clinical and imaging data.

Methods From the beginning of the COVID-19 pandemic in January 2020 to May 2021, databases of five German tertiary-care centers were searched for patients with coincidental ATEs associated with a COVID-19 disease. ATEs were examined regarding their localization, time of occurrence, radiographic characteristics, and associations with clinical data and laboratory parameters.

Results Out of 3267 COVID-19 patients, 102 patients (110 events; median age 76(11–102)) presented with ATEs (3.1%). Localization included cardiac(n=51), brain(n=43), peripheral(n=7), intestinal(n=3), precerebral arteries(n=3), aorta(n=1), kidney(n=1), and spleen(n=1). Some ATE showed patterns of massive thrombi with long-floating portions (Figure 1). Elevated CRP (median 45 mg/L) and fibrinogen levels (median 58) days after the onset of typical primary symptoms of COVID-19.

Conclusion COVID-19 is associated with an increased rate of ATEs generally affecting all areas of the arterial system and partially with an unusual radiographic pattern. Most clinically detectable ATEs occurred in arterial vessels of the brain and heart, although some emboli were detected in atypical localizations and in young patients. Approximately the first week after symptom onset seems to be the main critical period for the occurrence of an ATE.

REFERENCES

Do you have any conflict of interest to declare?: No
left posterior cerebral artery. The patient underwent intravenous thrombolysis and mechanical thrombectomy. Contrast injections confirmed the occlusion and revealed an asymmetric fusion of the basilar tip with a more cranial left P1 segment. The thrombus was removed by aspiration in the first attempt. Final injection demonstrated total recanalization and it was possible to see that the posterior thalamoperforating arteries had unilateral origin from left P1 segment. Control CT showed medial bi-thalamic and left paramedian midbrain infarcts. The patient significantly improved. Nevertheless, she had left ptosis, diplopia, impaired upward and downward gaze and unstable gait.

Conclusion This case highlights the importance of detection and treatment of a P1 occlusion, especially with unilateral origin of posterior thalamoperforating arteries, regardless of a dominant posterior communicating artery.

Introduction A great variety of neurointerventional devices now exist and practitioners may not be familiar with compatibility especially of newer devices. As procedures become more complex and guide catheters increase in size more devices can often be inserted into a single catheter lumen. Predicting in advance whether

(i) they will fit and
(ii) whether angiography can be performed can be non-trivial.

If 3 or more devices are used in a single lumen the problem is mathematically complex (a problem termed ‘circle packing’) and compatibility cannot be calculated by summation of the diameters. If devices are unexpectedly incompatible they must be discarded, increasing cost of procedures.

Aims of study Produce a model to predict device compatibility in terms of diameter, length, space for cerebral angiography, and liquid embolic usage.

Methods A large database of commercially available devices (catheters, balloons, stents etc.) was compiled consisting of manufacturer provided and empirically observed data on sizing and compatibility. A computational model employing the Matoušek-Sharir-Welzl algorithm was used to predict device fitting.1,2

Results The model was able to accurately predict device compatibility during procedures and was found to be a useful and easy-to-use clinical aid by neurointerventional practitioners.

Conclusions A tool was developed to aid in decisions regarding device sizing, ease of angiography, and liquid embolic compatibility. The tool and source code are freely available at https://www.neurotool.org/index.html. This is currently the only model that can accurately predict whether 3 or more devices will fit inside the single lumen of a larger device.

REFERENCES


Do you have any conflict of interest to declare?: No