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Abstract No. 155**Automating the collection of quality metrics in percutaneous interventions for permanent hemodialysis access via natural language processing**I. Nadeem¹, A. Issar¹, A. Brown¹; ¹McMaster University

Purpose: Well-functioning vascular access is critical in caring for hemodialysis-dependent patients. International guidelines have been created to support the reporting of quality metrics. However, manually generating these metrics retrospectively is time-consuming and impeded by heterogeneous reporting practices. The purpose of this project is to assess the completeness of reports describing vascular access interventions and demonstrate the efficacy of natural language processing (NLP) algorithms in generating quality metrics.

Materials and Methods: Radiology reports from May 28, 2019, to May 27, 2020, were retrieved from PACS and preprocessed to remove nulls and duplicates. A validated NLP classifier tool, iSCOUT, was used to identify reports containing ≥ 1 arteriovenous fistula-related term(s) and ≥ 1 intervention-related term(s). Two pipelines were developed: (1) negation of terms considered, and (2) negation disregarded. Statistical analyses were conducted to evaluate performance. The reports were manually annotated for inclusion of data required to calculate two quality metrics: (1) post-intervention primary patency (PiPP), defined as the interval of uninterrupted patency between interventions at any site within the dialysis circuit, and (2) post-intervention lesion patency (PiLP), defined as the interval of uninterrupted patency between interventions at/adjacent to the same lesion site. A Python script was designed to calculate PiPP using the metadata from each radiology report. Ground truth was manually annotated.

Results: The pipeline that disregarded negation performed best with an F1 score of 0.9385, resulting in higher recall but lower precision compared to the pipeline that considered negation. Applying the Python script to ground truth resulted in the same PiPP rates as manual annotation. Only 20.3% and 17.9% of reports were self-sufficient in providing information required to calculate PiPP and PiLP, respectively. Therefore, standardized reporting elements adapted from international guidelines were proposed to support the automated generation of quality metrics.

Conclusions: NLP was successful in identifying relevant reports from an unfiltered dataset and achieved similar PiPP rates as ground truth. Only a small percentage of reports contained information required to generate vascular access quality metrics. NLP and standardized reporting have the potential to automate the generation of medically relevant quality metrics, thereby improving communication, promoting guideline adherence, and providing data for future quality improvement projects.

Abstract No. 156**Incidence and outcomes of cholecystostomy tubes in COVID-19 patients**A. Som¹, N. Reid², T. Yeung², S. Salamone², A. Snyder², G. Salazar¹, M. Succi¹, D. Daye¹, Raul N. Uppot¹; ¹Massachusetts General Hospital; ²Harvard Medical School

Purpose: Our goal was to review the incidence and outcomes of cholecystostomy tube placement during the COVID pandemic as compared to matched controls.

Materials and Methods: Monthly interventional radiology (IR) case volume was evaluated during the COVID pandemic through July 30, 2020, and was compared to monthly IR case volume during the same time period in 2019. A retrospective review of 40 patients who received percutaneous cholecystostomy tubes between March 2020 and July 2020 (first COVID pandemic peak in Boston, MA) was compared in a propensity matched controlled study. 14 COVID-positive patients were matched to 26 control patients who received a cholecystostomy tube. Outcomes such as positive cholecystostomy tube microbiology, pre-procedural ICU status, and death were evaluated.

Results: During March to July 30, 2020, cholecystostomy tube placement constituted 0.43%, average 6 (range 2-10) cases/month of 1389 (range 672-1777) cases/month, whereas in the year prior for the same period it constituted 0.28%, 5.8 (range 4-8) cases/month of 2103 (range 1998-2146) cases/month. We find the average age was 66.5 ± 17.7 (SD) for COVID-negative and 66.0 ± 17.7 (SD) years for COVID-positive patients. Pre-procedure 19% (5/26) of COVID-negative patients and 50% (7/14) of COVID-positive patients were intubated at the time of placement, $P = 0.04$. Post-procedure, 54% (14/26) of COVID-negative patients and 50% (7/14) of COVID-positive patients had positive cholecystostomy tube fluid microbiology cultures, $P = 0.82$. 38% (10/26) of COVID-negative patients and 57% (8/14) of COVID-positive patients were in the ICU at the time of placement, $P = 0.26$. 23% (6/26) of the COVID-negative patients and 36% (5/14) of COVID-positive patients died post-procedure, $P = 0.41$. 15.4% (4/26) COVID-negative and 14.3% (2/14) of COVID-positive patients had any complications reported, $P = 0.93$.

Conclusions: During the COVID-19 pandemic, we observed a relative increase in the number of cholecystostomy tube referrals despite a drop in total IR case volume. There were no significant differences in post-procedure long-term outcomes and the microbial culture results in our matched control review. Our study suggests that this perceived increase in cholecystostomy tube placements is not secondary to unique COVID pathophysiology, but rather a persistent incidence of acalculous cholecystitis in the setting of chronic ICU stays seen during the COVID pandemic. With the continuation of the pandemic, cholecystostomy tube placement incidence may increase with continued COVID patient care and chronic ICU stays for these patients.

Abstract No. 157**Computed tomography-guided percutaneous microwave ablation as bridging therapy for patients with hepatocellular carcinoma awaiting liver transplant: a single-center experience**N. Reid¹, A. Som², R. Cochran², T. An², R. Uppot², O. Zurkiya², E. Wehrenberg-Klee², R. Arellano²; ¹Harvard Medical School; ²Massachusetts General Hospital

Purpose: Our objective was to determine the pathologic response of computed tomography (CT)-guided percutaneous microwave ablation as bridging therapy for patients with hepatocellular carcinoma awaiting liver transplant.