

Data Preprocessing for the VQI TEVAR Dataset

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Datasets Merging

Compare the data from July 2021 and September 2021. Keep the most updated ones by merging TEVAR_LTF_07 with TEVAR_LTF_09, and TEVAR_PROC_07 with TEVAR_PROC_09 separately.

Variables that exists in both LTF and PROC datasets are: PATIENTID, PRIMPROCID, DEAD, PROC_SURVIVALDAYS. Merge by these variables.

We will work on the PROC and LTF datasets separately. The only variable we want to study in the LTF dataset is the re-intervention variable, LTF_NUM_REINT.

For the time-to-event analysis of re-intervention, we work on the LTF dataset and treat it as a multi-event recurrent survival analysis.

For the logistic regression model of re-intervention, we merge it with the PROC dataset to account for the variables as we did for other outcomes. Here we treated re-intervention as a binary outcome.

Exclusion criteria:

- PRESENTATION: exclude rupture patients
- PATHOLOGY: exclude groups with pathology: 4 = trauma, 8 = Aortic Thrombus, 9 = Other, 10 = Aorto-esophageal Fistula, 11 = Aorto-bronchial Fistula
- URGENCY: exclude rupture. (`elective` is the same as `asymptomatic`)
- PROXZONE_DISEASE: exclude 0 and 1
- DISTZONE_DISEASE: exclude 0
- PROXZONE_DISEASE < DISTZONE_DISEASE: disease starting point should be earlier than ending point. 35 wrong data points with distal zone < proximal zone are excluded.

Data Cleaning

Patient demographic and co-morbidities

- Comorbidity history variables: changed to Yes/No scale.
- PREOP_CREAT: merge PREOP_CREAT with retired R_CR_PRESENT (mg/dL)

Operative variables

- PATHOLOGY: merge levels PAU and IMH
- URGENCY: duplicate with PRESENTATION and doesn't make sense, but leave it there.
- extent: type of TAAA based on certain criteria calculated by PROXZONE_DISEASE and DISTZONE_DISEASE.
- ILIACDEV_END: from merging ILIACDEV_END_R, ILIACDEV_END_L

- ACCESS: from merging ACCESS_R, ACCESS_L: Percutaneous if both are Percutaneous, Open o.w.
- DEV_GTYPE: merge DEV1_GTYPE, DEV2_GTYPE, DEV3_GTYPE: If one device is 'Custom' or 'Physician modified', classified to this instead of 'Standard'

Filter FBVAR patients based on having at least one branch, re-leveled as following.

- lrenal: re-leveled BRANCH_LRENAL_TRT, retired version R_LT_RENAL ignored.
- rrenal: re-leveled BRANCH_RRENAL_TRT, retired version R_RT_RENAL ignored.
- sma: re-leveled BRANCH_SMA_TRT, retired version R_SMA ignored.
- celiac: re-leveled BRANCH_CELIAC_TRT, retired version R_CELIAC ignored.
- lsub: re-leveled BRANCH_LSUB_TRT, retired version R_L_SUBCLAV ignored.

Current levels: 0 = None,1 = Purposely covered,2 = Unintentionally covered,3 = Occluded - coil,4 = Occluded - plug,5 = Occluded - open,6 = Stent,7 = Stent-graft,8 = Chimney,9 = Scallop,10 = Stented Scallop,11 = Fenestration,12 = Stented-fen,13 = Fen branch,14 = Side-arm branch,15 = Surgical bypass,16 = Thromboembolectomy,17 = Iliac Device

ignore some retired variables without current version

- R_DISTATTZONE: Distal Attachment Zone
- R_GDPROXIMAL: Graft Diameter Proximal
- R_GRFTCONFIG: Graft Configuration
- R_PRATTZONE: Prox. Attachment Zone

Outcomes

- POSTOP_LOS: changed into binary, more than a week or not.
- Create POSTOP_AH: Combine POSTOP_AH, POSTOP_MI,POSTOP_DYSRHYTHMIA for post-procedure abnormal heart disease
- Create BRANCH_POST: BRANCH_XXX_POST changed to Yes/No scale. Then combine BRANCH_LSUB_POST, BRANCH_CELIAC_POST, BRANCH_SMA_POST, BRANCH_RRENAL_POST, BRANCH_LRENAL_POST, BRANCH_RCOMILI_POST, BRANCH_LCOMILI_POST

update some variables with current version

- R_ENDOLEAK_AT_COMPLETION => LEAKATCOM_XXX variables. Only use LEAKATCOMP_NONE. Ignore others or have a brief look
- R_POSTOP_HEMATOMA => ACCESS_HEMATOMA_R, ACCESS_HEMATOMA_L; R_POSTOP_SITEOCC => ACCESS_OCCLUSION_R, ACCESS_OCCLUSION_L. Merge hematoma and occlusion, create new variable: ACCESS_COMPLICATION
- R_POSTOP_SSI => ACCESS_INFECTION_R, ACCESS_INFECTION_L Merge left and right, create new variable: ACCESS_INFECTION

ignore some retired version variables, only use the current version

- R_POSTOP_BOWELISCH <= POSTOP_INTISCH: Bowel Ischemia
- R_LE_ISCH <= POSTOP_LEGEMBO: LE Ischemia
- R_POSTOP_RENAL <= POSTOP_DIALYSIS: change of renal function

record treatment status of the vessels

- NUM_TREATED_BRANCHES: number of treated branches: 4,3,2,1
- NUM_TREATED_RENALS: number of treated renals: 2,1,0
- OCCLUDED_RENAL,OCCLUDED_SMA,OCCLUDED_CELIAC,OCCLUDED_LSUB: whether this vessel is occluded or covered.

Volume variables

Duplicate variables

We checked the duplicate PATIENTID in the PROC dataset. These patients are transferred a few days or a few months following the first procedure. We decided to exclude these abnormal data points.

Store a new dataset for further study

Select the variable related to our study. Give them labels for better-looking tables. Finally store the new dataset as a separate csv file, so that we could use the cleaned dataset in the future modeling.