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# Tips and Tricks to improve outcomes Rupture AAA

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## Disclosure

Speaker name: Skyi Pang

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I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)
  
- I do not have any potential conflict of interest



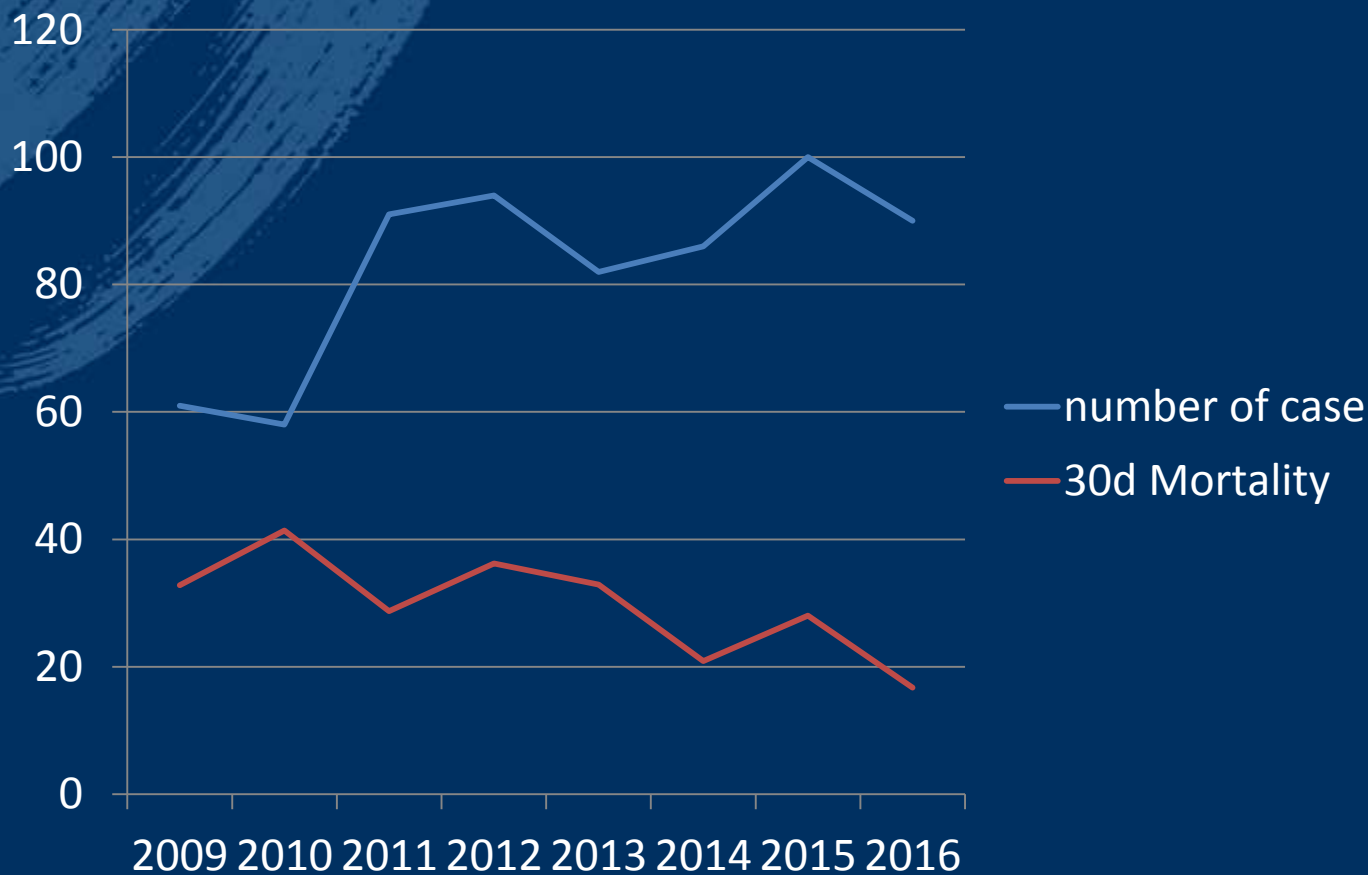
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# Rupture Abdominal Aortic Aneurysm In Hong Kong



Data from Surgical Outcomes Monitoring & Improvement Program reports





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# Dilemma?

- EVAR or Open
- Current Evidence
  - **Systemic review**
    - All concluded 30 day mortality is lower for endovascular (21-35%) versus (42-50%) for open repair
    - **Rupture EVAR is feasible**
  - **Randomized Trial**
    - AJAX & ECAR Trials
      - **Comparable peri-operative mortality for EVAR/open repair for favourable anatomy**
    - IMPROVE Trial
      - **Comparable peri-operative mortality for endovascular and open strategy**



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# From literatures

Peri-operative mortality  
Hospital stay  
Conversion rate

**Table 1.** Characteristics of studies included in the meta-analysis.

Author (Year)	Study type	Institute or database	Number of cases	Age (year), mean	Gender, male (%)	Hospital stay (days), mean	Peri-operative mortality (%)	Conversion to open surgery (%)	Study quality maximum 9 <sup>2</sup>
Alsac JM (2005) [22]	prospective	Henri-Mondor University Hospital, Creteil (France)	17 vs. 20	72.9 vs. 72.8	94 vs. 100	Median: 11.5 vs. 20	23.5 vs. 50.0	17.6	
Davenport DL (2010) [30]	retrospective	American College of Surgeons National Surgical Quality Improvement Program database	99 vs. 328	72.1 vs. 73.6	80 vs. 77	NA	22.2 vs. 37.2	NA	
Egawa T et al (2006) [26]	retrospective	Medical Research and Statistical Analytical and Demographic Unit (USA)	121 vs. 446	72.6 vs. 73.9	80 vs. 77	NA	41.1 vs. 52.7	7	
Geetha R et al (2011) [23]	retrospective	Healthcare Cost and Utilization Project Nationwide Inpatient Sample database (USA)	2323 vs. 26106	Female: 78.8 vs. 78.2 Median: 75 vs. 73	NA	Median: 7 vs. 9	32.6 vs. 41.5	NA	
Glavin EA (2008) [24]	retrospective	American College of Surgeons National Surgical Quality Improvement Program database (USA)	121 vs. 446	72.6 vs. 73.7	80 vs. 76	Median: 7 vs. 10	24.0 vs. 36.0	4.1	
Greco G (2006) [20]	retrospective	The hospital discharge databases for the four states of California, Florida, New Jersey and New York (USA)	NA	NA	NA	13.4 vs. 19	39.3 vs. 47.7	N=20	
Hinchliffe RJ (2006) [23]	Prospective, randomized controlled	University Hospital, Nottingham (UK)	15 vs. 17	Median: 74 vs. 80	73 vs. 76	Median: 10 vs. 12	53.3 vs. 52.9†	133	NA
Holt PJ (2010) [33]	retrospective	National Health Service Hospital Episode Statistics (UK)	335 vs. 4079	NA	NA	NA	32.2 vs. 47.4	NA	
Vogel TR (2009) [34]	retrospective	Healthcare Cost and Utilization Project New Jersey State Inpatient Database (USA)	82 vs. 618	NA	NA	14.08 vs. 13.42	45.1 vs. 52.4	NA	
Leon LR Jr (2005) [27]	retrospective	Illinois Hospital Association COMPdata database (USA)	55 vs. 2063	NA	75 vs. 77	11.7 vs. 13.1	36.4 vs. 42.4	NA	
Lesperance K (2008) [35]	retrospective	Healthcare Cost and Utilization Project Nationwide Inpatient Sample database (USA)	949 vs. 8962	73.9 vs. 73.1	78 vs. 76	Median: 6 vs. 9	31.0 vs. 42.0	NA	
Mandawat A (2012) [36]	retrospective	Healthcare Cost and Utilization Project Nationwide Inpatient Sample database (USA)	64 vs. 207	70.5 vs. 72	73 vs. 76	NA	<18.0 vs. 35.7	NA	
McPhee J (2009) [37]	retrospective	Healthcare Cost and Utilization Project Nationwide Inpatient Sample database (USA)	3179 vs. 24571	74.3 vs. 73	77 vs. 77	NA	31.7 vs. 40.7	NA	

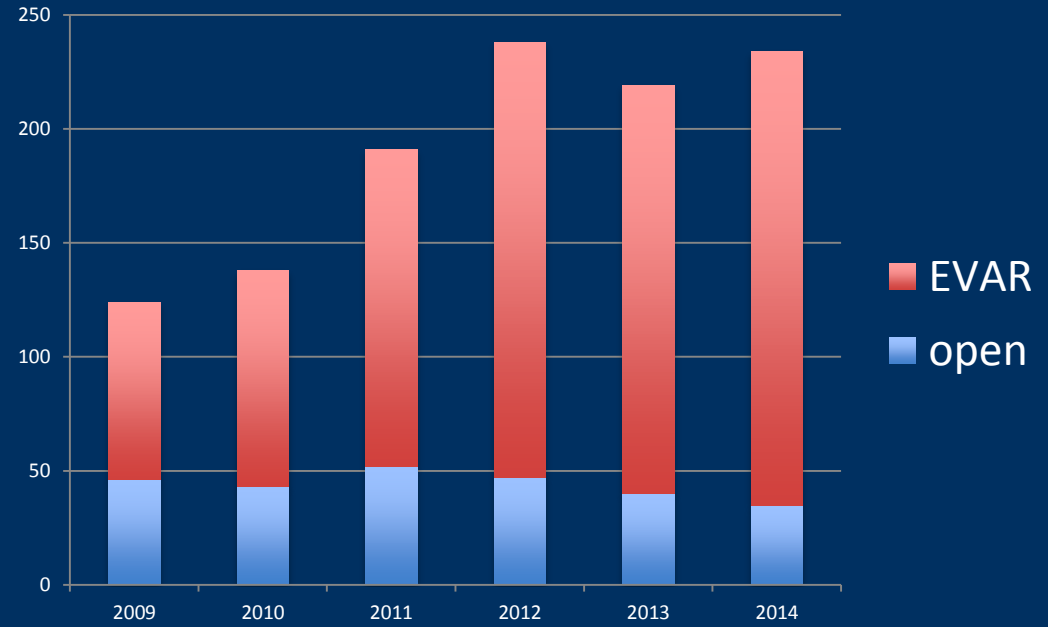




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# Realistic Situation

- EVAR predominant in elective setting
- Deterioration in open experience is a concern



Data from SOMIP reports, Hospital Authority Hong Kong





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# Situation in Hong Kong

- Area: 2,754 km<sup>2</sup>
- 7 Clusters of hospital network
- 10 hospitals performing aortic surgery
- Case volume may have impact on surgical outcome
- Centralization is important





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# Rupture AAA Protocol

- To standardize the management algorithm is the key to success
- EVAR first approach
- $\neq$  EVAR for all
- Logistic may varies among different hospitals



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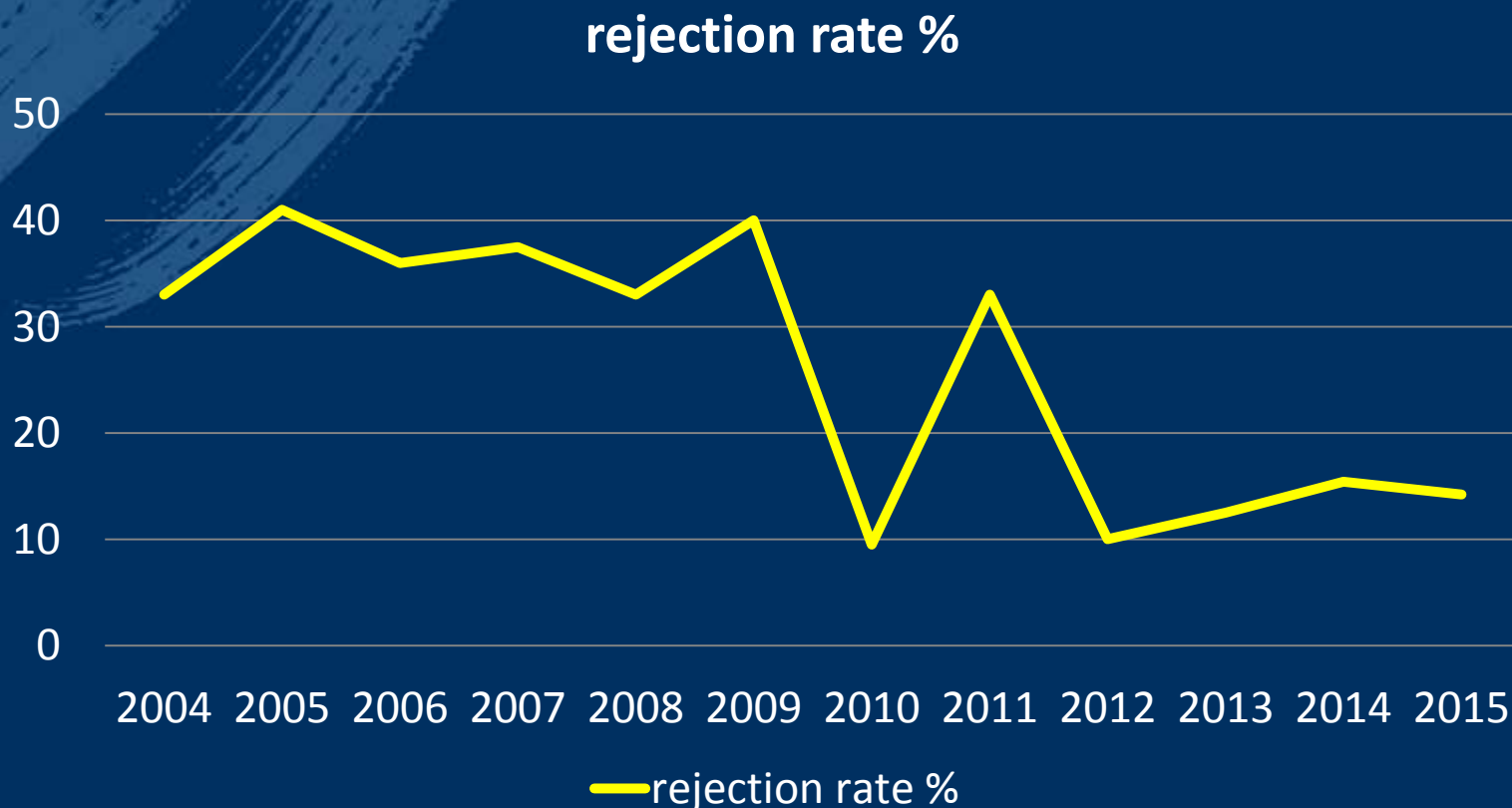




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# Upon standardization

- Lower rejection rate - 13.5%





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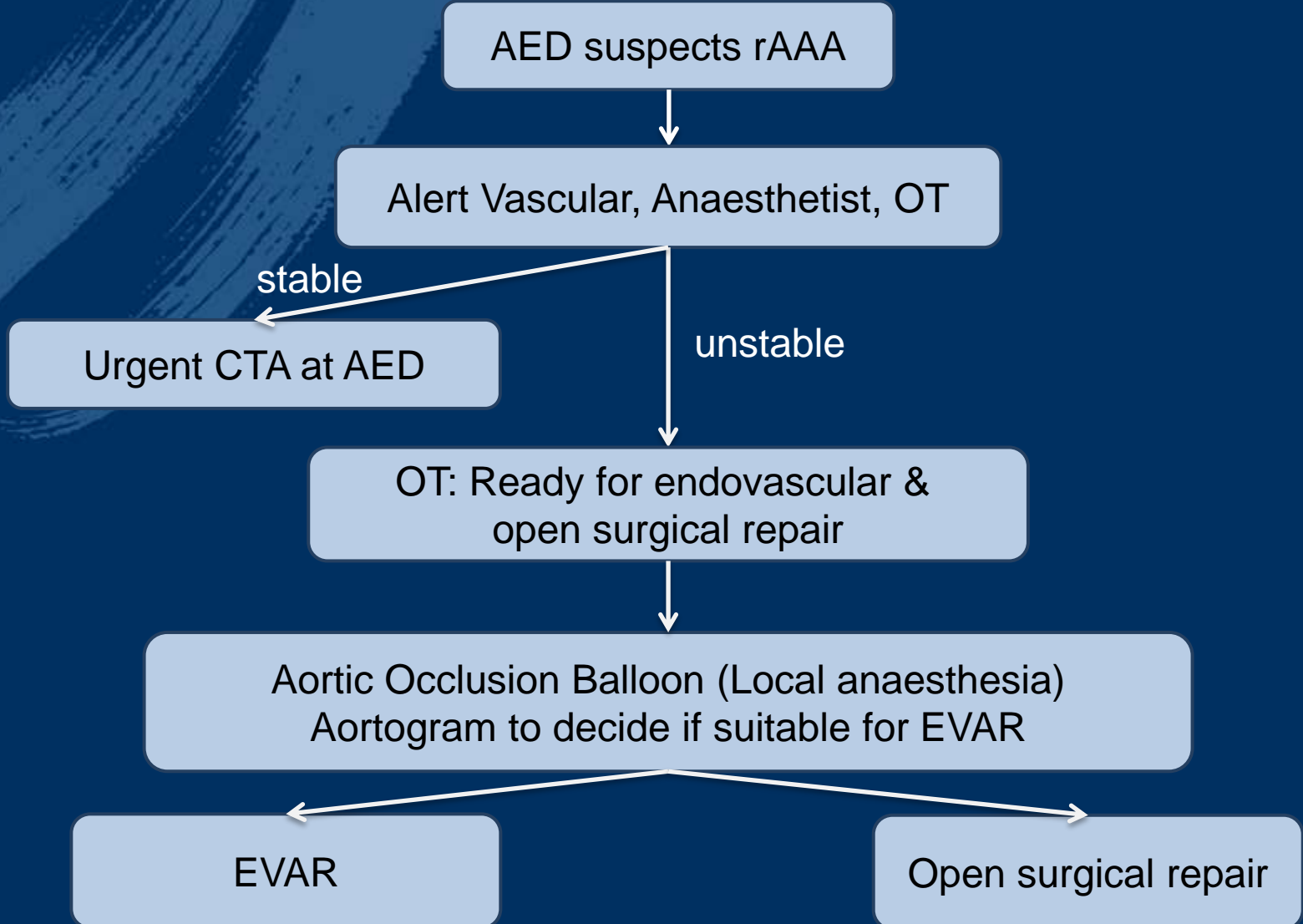
# Team work and Communication

- Diagnosis, Resuscitation and Logistic arrangement
  - A&E Physician, In-house Surgeons, Anaesthetist
- Planning ,preparation and operation
  - Vascular Surgeon/Interventionist, OR Nurse and supporting staff, Radiographer
- Post operative support
  - Intensive Care Unit and Vascular Surgeon





# Workflow





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# Standardization of theatre setup

## Theatre preparation for rupture AAA

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# Planning

- Choice of stentgraft
  - The most familiar one for your team
- CT Aortogram
  - Better than intra-operative aortography
- More generous oversizing is important

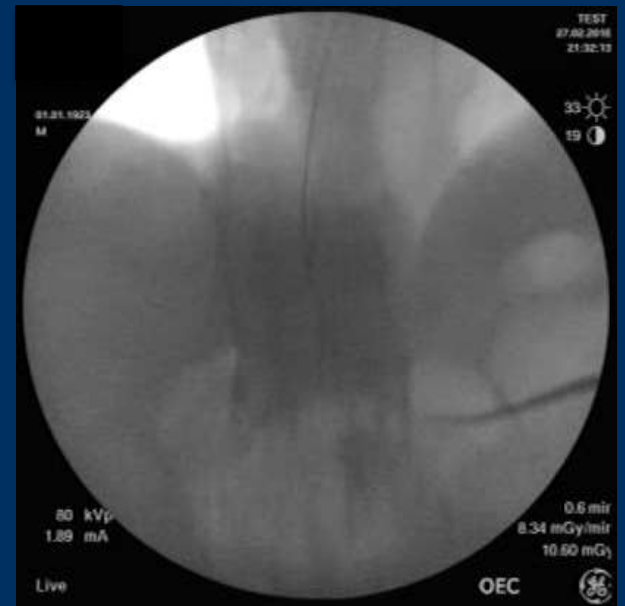




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# Aortic Balloon Placement

- Performed under local anaesthesia
- Place the aortic balloon at supra celiac level
- Supported by 16Fr 35/45cm long sheath
- ? Association with poor outcome

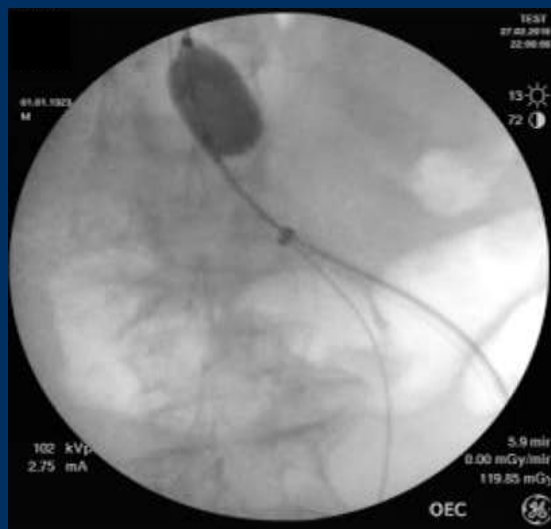




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# Continuous aortic control

- Important for frank rupture case
- Aortography- Prompt deployment of bifurcated graft
- Early restoration of mesenteric perfusion

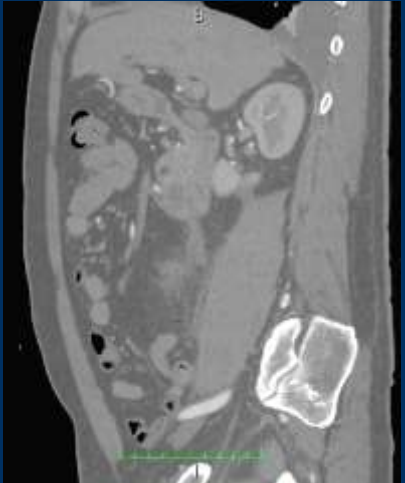




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# Difficult neck

- Short/angulated neck
  - Palmaz stent
  - Chimney technique



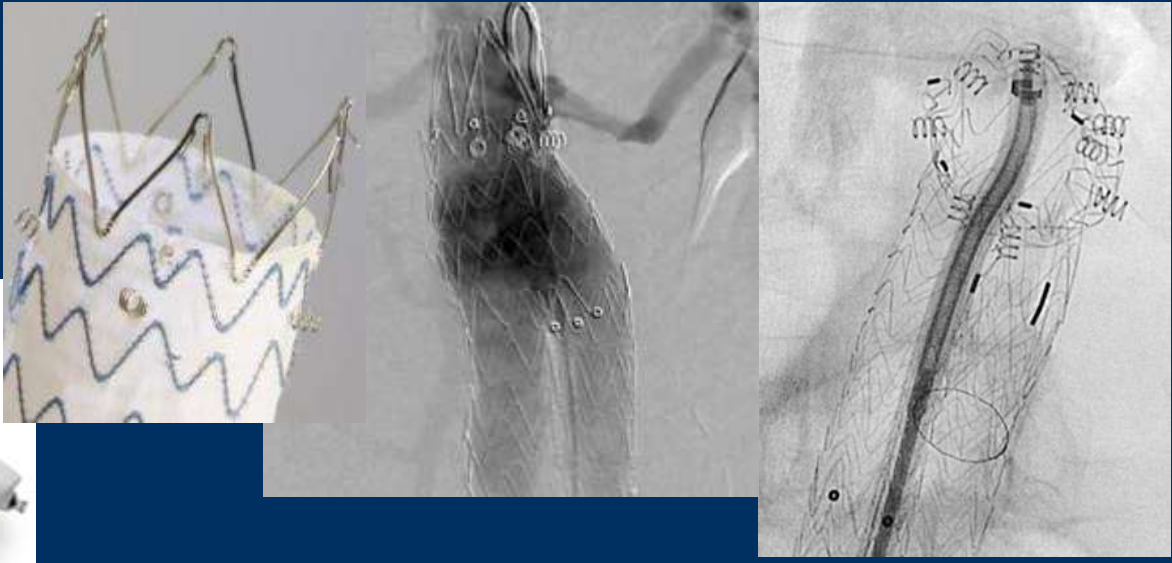




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# Difficult neck

- Short/angulated neck
  - Specific stent-graft for angulated neck
  - Endoanchor

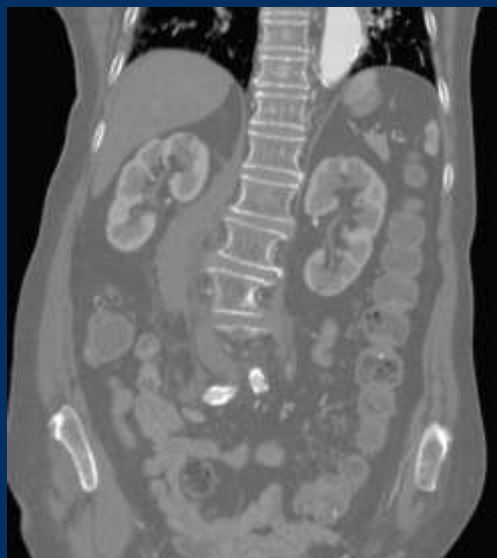




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# Direct open repair

- Never a failure
  - Acute angulated and narrow neck
  - Known unfavourable anatomy
  - Facilities, expertise or the team is not ready



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# Post-op Management

- As important as a successful operation
- On-going type II endoleak
  - Cause of mortality even successful EVAR
  - Difficult to determine
    - Under-resuscitation
    - Exclusion of persistent type 1 leak
    - Abdominal compartment syndrome
    - Myocardial infarction
    - Bowel ischaemia

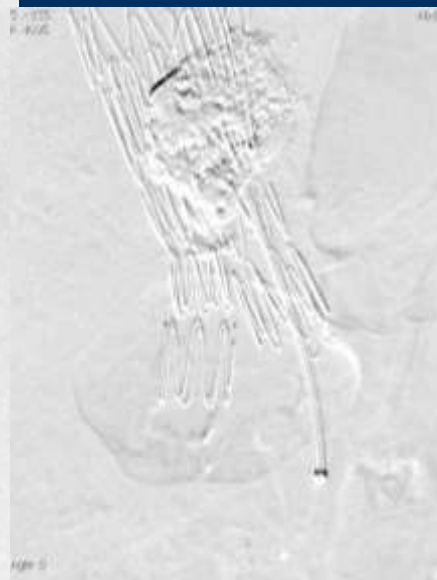




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# On-going type II leak

- To perform CT scan earlier if in doubt
  - Open surgery with plication of bleeders
  - Endovascular intervention





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# Conclusion

- Standardization/Rupture Protocol is essential
  - To lessen the stress for the multidisciplinary team
  - To improve the success rate
  - To lower the rejection rate
- Technical point
  - Aortic balloon in place before general anaesthesia
  - Generous oversizing in planning
  - Use the most familiar stentgraft if possible
  - Sharp decision for open when indicated





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