

# Retrospective Review of Significant Extracolonic Findings in CT Colonography

Dr Mathangi Krishnakumar (ST4 Radiology Registrar)

Dr Yash Achhapalia (ST1 Radiology Registrar)

Dr Monojit Mondal (Consultant Radiologist)

Ysbyty Gwynedd, Betsi Cadwaladr University Health Board



# Background

- CT Colonography (CTC) is increasingly becoming the investigation of choice for suspected colorectal malignancies.
- Compared to other traditional investigations such as Barium enema, CTC has the unique feature of helping reveal Extracolonic Findings (ECF)<sup>1</sup>.
- As per guidelines by the Royal College of Radiology from 2023, *patients with abdominal symptoms requiring extracolonic evaluation in addition to colonic assessment* is a valid indication for CT Colonography<sup>2</sup>.

# Background

- Results from previous studies have demonstrated detection of ECF anywhere in the range between 15-85%, however only a small percentage of patient reported to have results of clinical significance required urgent clinical review or intervention<sup>1</sup>.
- Early detection of these clinically significant lesions may lead to better long-term outcomes<sup>1</sup>.
- The ECF were classified according to the CT colonography reporting and data system<sup>3</sup>.

# Aims

1. To determine the prevalence of ECF in patients undergoing CTC
2. To characterise and classify these ECF according to the C-RADS score
3. To discern the clinical significance of ECF reported in CTC

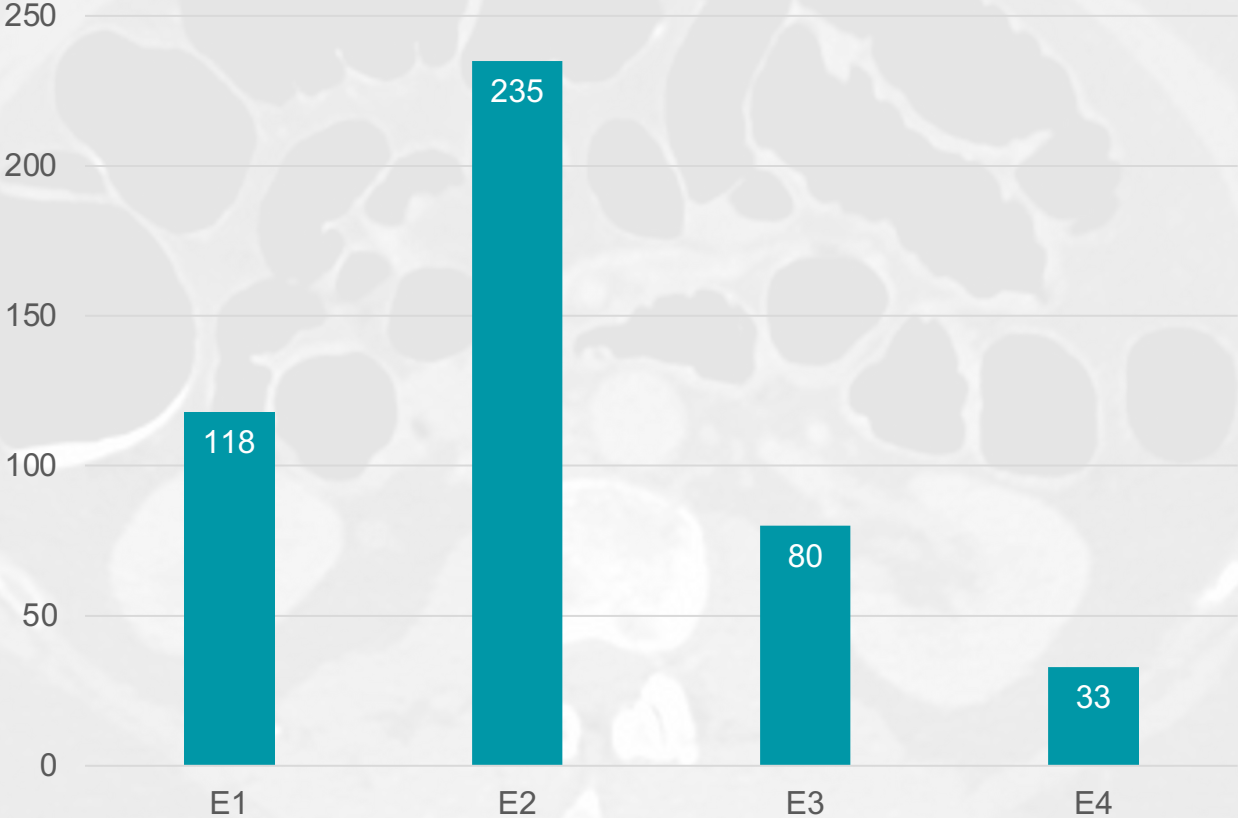
# Classification of Extracolonic Findings (adapted from Zallis et al.)

Classification	Description	Example(s)
E0	Inadequate study	Limitation due to inadequate sufflation, preparation etc
E1	Normal exam or normal anatomical variant	
E2	Clinically unimportant finding	Simple cysts (renal, hepatic, splenic), gallstones without related complications
E3	Indeterminate or incompletely characterised finding	Minimally complex or hyperattenuating cyst, pleural effusions, consolidation,
E4	Potentially significant finding	Solid organ malignancy, unsuspected aortic aneurysms, clinically significant lymphadenopathy, cirrhosis

# METHODOLOGY

- A retrospective analysis was conducted on all CTCs that were performed within our institution from January 1, 2023 to November 1, 2023. This included both screening and symptomatic populations.
- The ECF were classified and recorded according to the E-RADS score.
- For those patients with E3 or E4 findings, follow-up clinical information regarding treatment of detected disease, further radiological and/or histological investigations were recorded using the hospital information system.

# RESULTS: HOW MANY ECF WERE FOUND?

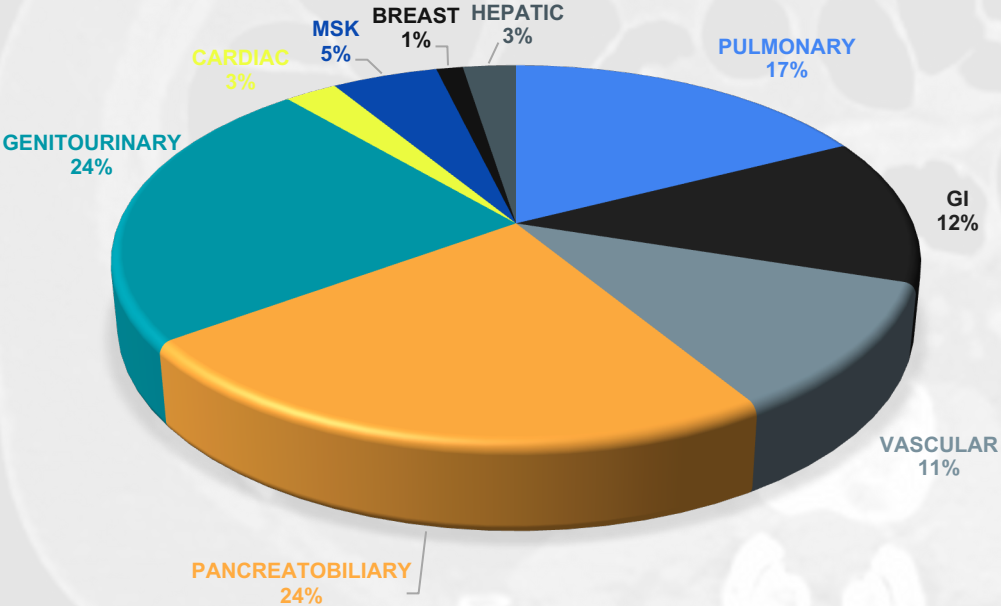


# RESULTS

- Out of a total of **466 CTCs**, 446 were from symptomatic population, 13 from screening and 7 from surveillance.
- Demographic characteristics of patients from this study included a *mean age of 73.7 years*, 35% male and 65% female.
- **74.6% (348/466) patients had at least one extracolonic finding.**
- 59% of E2 findings were simple renal and liver cysts, uncomplicated gallstones and hiatus hernia.
- **7% (33/466) patients had E4 findings reported.** Out of these 33 patients, 5 of them had extracolonic metastasis related to primary colonic malignancy.
- No patient in the study had two or more E4 findings. 1 patient had synchronous primary colorectal and bladder malignancy.

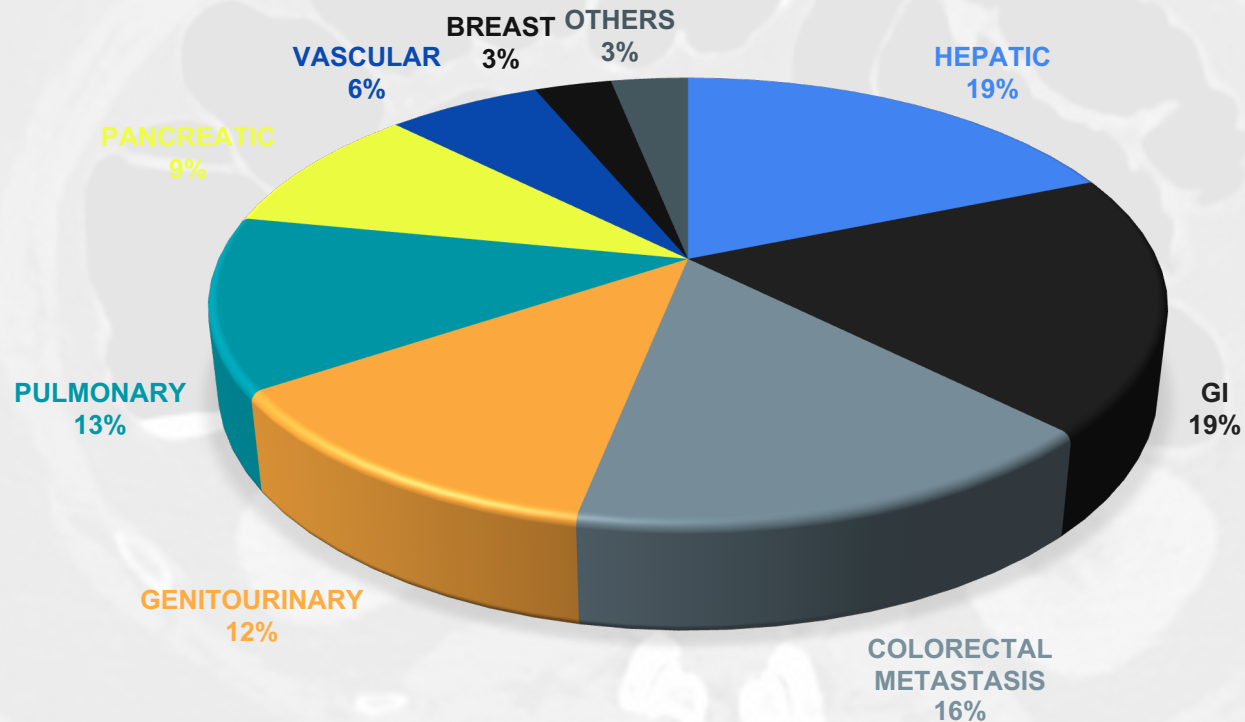


# RESULTS: E3 FINDINGS



*One E3 finding with an indeterminate lung nodule was found to be a metastatic nodule from a primary lung malignancy which was diagnosed in the follow-up scan.*

# RESULTS: MOST COMMON E4 BY ORGAN SYSTEM

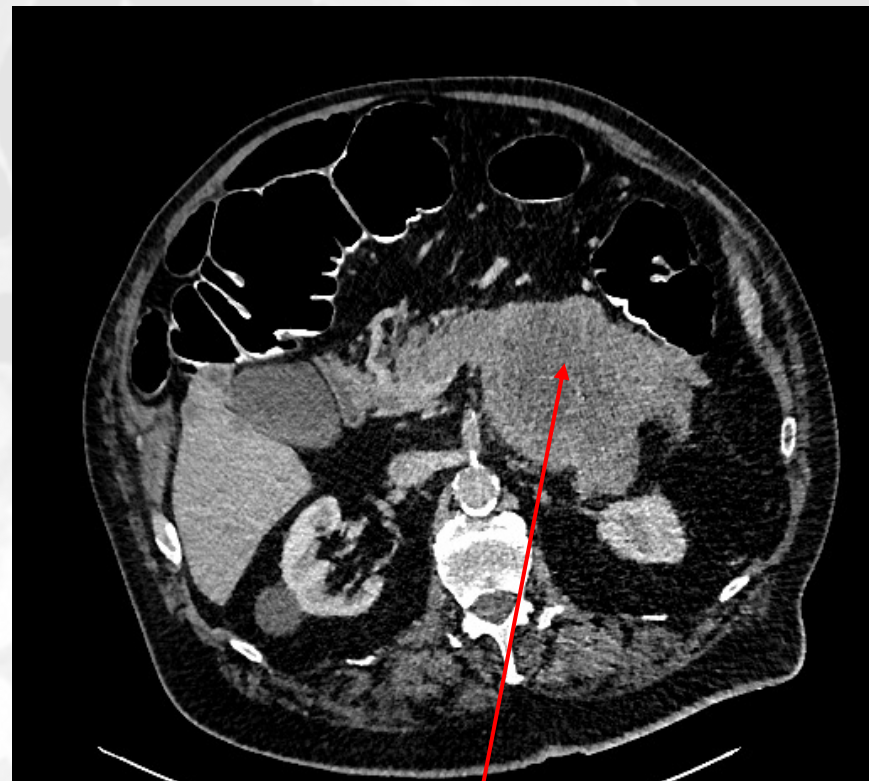
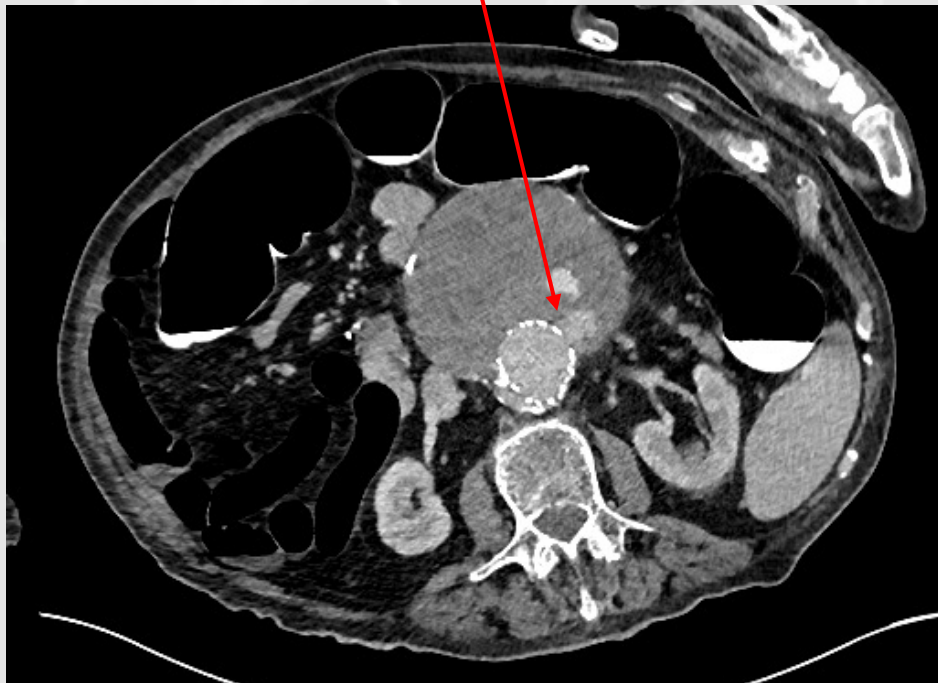


# RESULTS: BREAKDOWN OF E4 FINDINGS

<b>ORGAN SYSTEM</b>	<b>ORGAN OF ORIGIN</b>	<b>EXTRACOLONIC FINDING</b>	<b>TOTAL DETECTED</b>
<b>PULMONARY</b>	Bronchial	Lung mass	3
		Pulmonary embolism	1
<b>GASTROINTESTINAL</b>	Hepatic	Liver cirrhosis	6
	Pancreatic	Pancreatic mass	3
	Small bowel	Small bowel obstruction	1
		Duodenal mass	1
		Appendiceal mass	1
	Oesophagus	Oesophageal thickening/mass	3
<b>GENITOURINARY</b>	Renal	Renal mass	3
	Bladder	Bladder mass	1
<b>VASCULAR</b>	Aneurysm	AAA > 5cm	1
		EVAR with endoleak	1
<b>HAEMATOLOGICAL</b>	Lymphatics	Lymphoma	1
<b>BREAST</b>	Breast	Breast mass	1
<b>OTHERS</b>	Postsurgical	Rectus sheath haematoma	1
<b>METASTASIS FROM COLON MALIGNANCY</b>			<b>5</b>

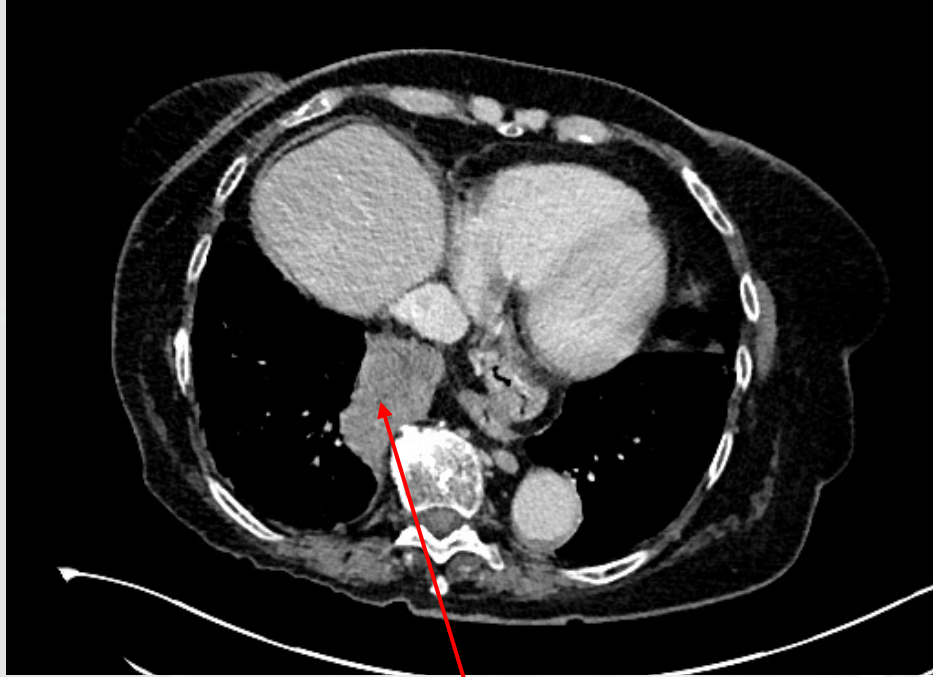
# EXAMPLES OF E4 FINDINGS

AAA with endoleak

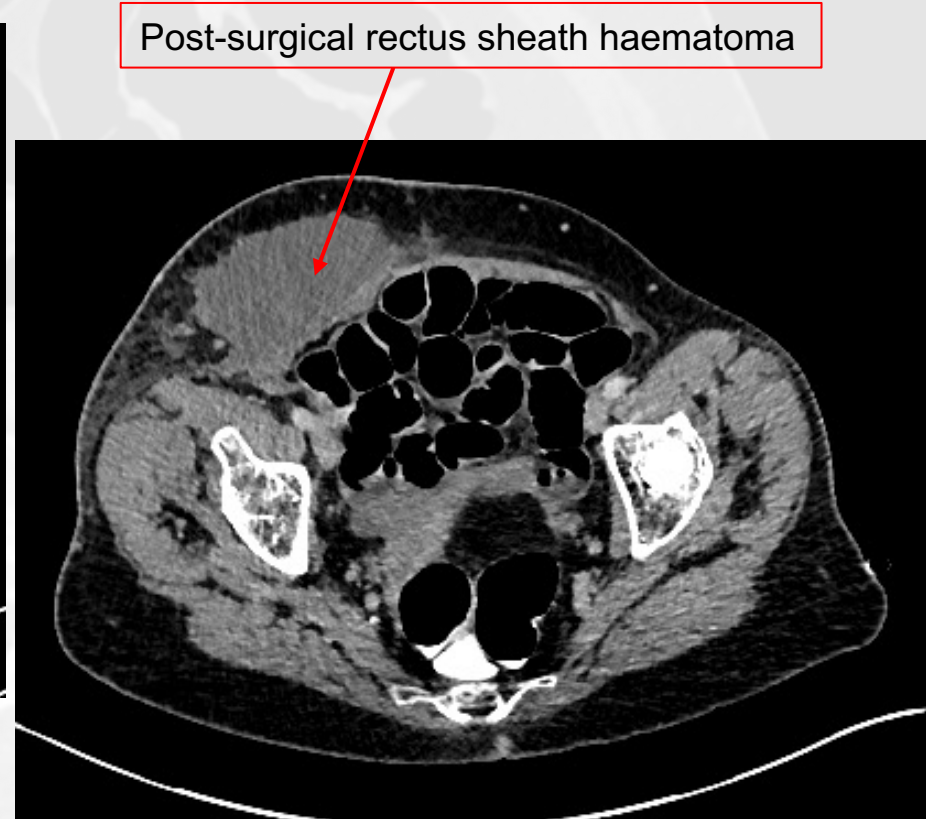


Pancreatic mass

# EXAMPLES OF E4 FINDINGS

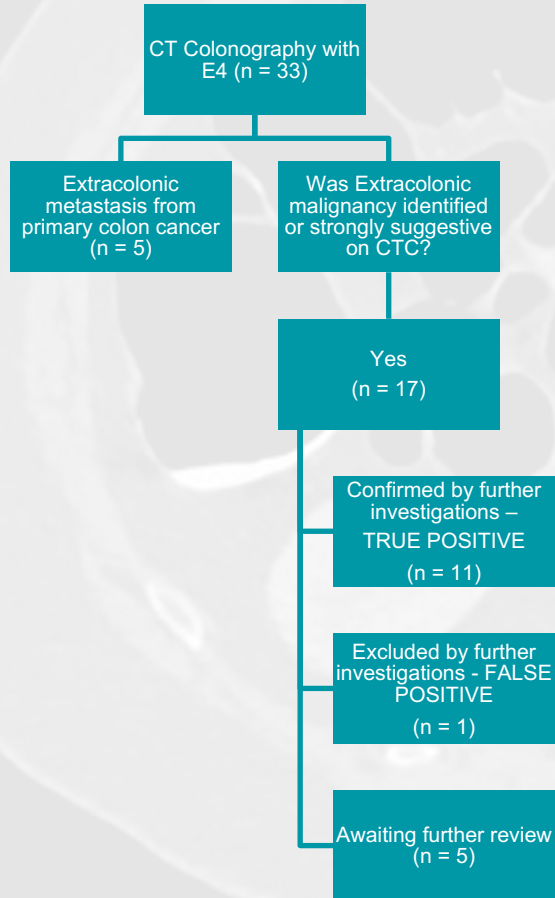


Right lung base mass



Post-surgical rectus sheath haematoma

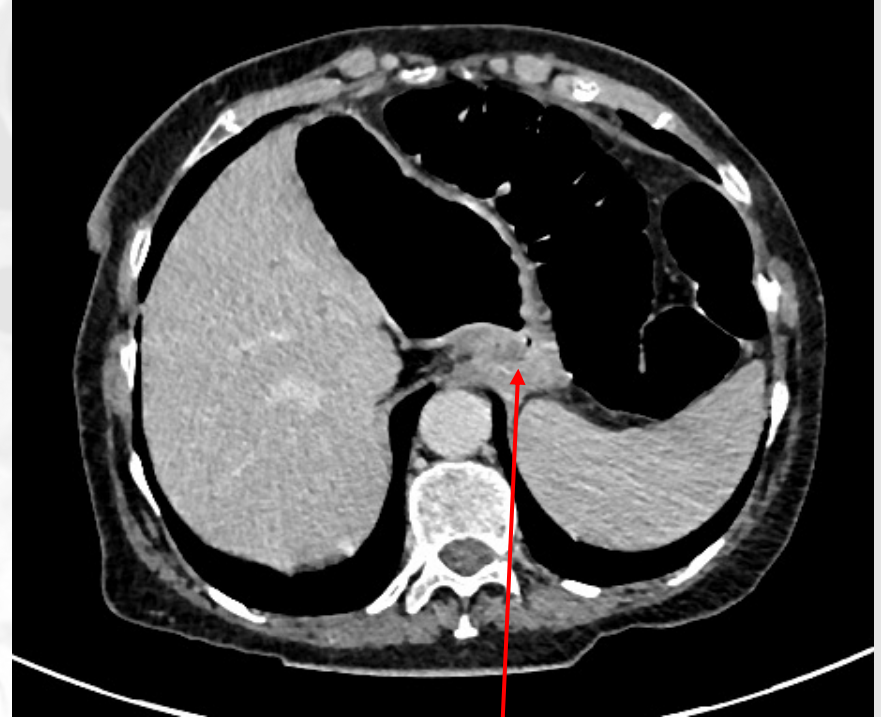
# RESULTS: E4 EXTRACOLONIC MALIGNANCY



- 11 E4 findings were true positive for Extracolonic malignancy that were confirmed by further radiological or histological correlation, with 5 still under review.
- Of the 11, primary bronchial and oesophageal malignancies were found to be the most common (n = 4).
- Only 1 E4 finding was false negative for Extracolonic malignancy.

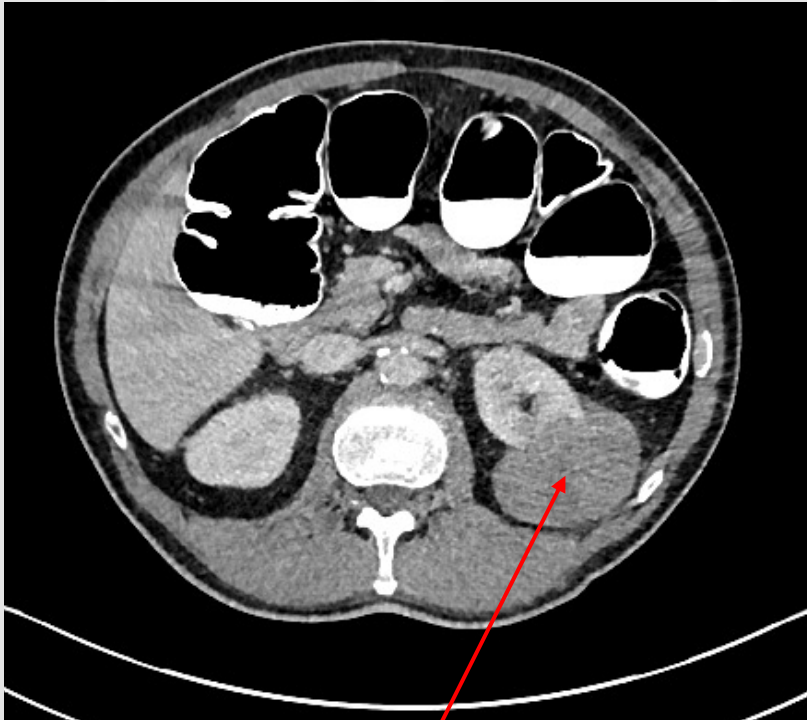
# EXAMPLES OF E4 FINDINGS

Bladder tumour

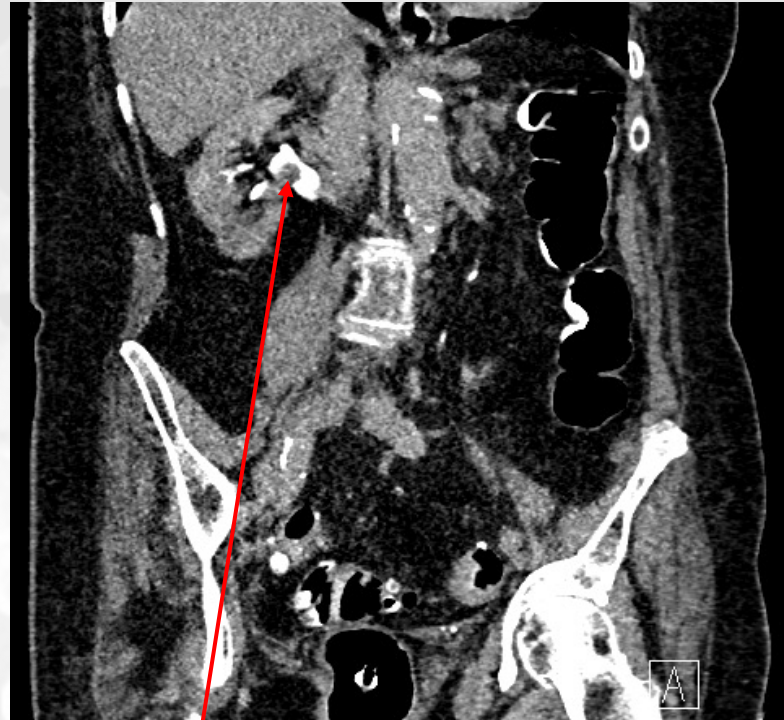


Gastro-oesophageal junction thickening

## EXAMPLES OF E4 FINDINGS



Left renal mass



Histologically proven right transitional cell cancer



# DISCUSSION

- *All 11 confirmed extracolonic malignancies were found in symptomatic patients.*
- *31 patients were found to have colorectal malignancy, 2 of which were in the screening group.*
- **E4 comprised 7% of ECF.** This is slightly higher compared to other published studies which quotes a range between 2-3%<sup>4</sup>.
- Causes for this would include:
  - A higher proportion of symptomatic population in this study (95.7%)
  - An older cohort of patients (median age in this study group was 81 compared to 61-66 years in other studies)
  - Administration of intravenous contrast (all symptomatic CTCs in our institution were performed with IV contrast as per local guidelines unless contraindicated)
- Another factor for higher rates of ECF in CTCs that was reported in a meta-analysis<sup>4</sup> included larger female cohorts due to E3 adnexal findings. However, only 5 out of 80 E3 findings were due to adnexal findings in our study.

# CONCLUSION

Our analysis aimed to ascertain the prevalence, characteristics and clinical significance of ECF reported in CTCs within our health board.

*The rate of ECF and E4 findings were higher compared to other studies in the literature. This is likely due to a greater proportion of symptomatic population and the use of intravenous contrast in our study.*

In summary, this review further surmises that CTCs are useful in recognising potentially significant ECF especially within a symptomatic population.

# REFERENCES

1. Badiani S, Tomas-Hernandez S, Karandikar S et al. Extracolonic findings (ECF) on CT colonography (CTC) in patients presenting with colorectal symptoms. *Acta Radiologica*. 2013 Oct 1;54(8):851–62.
2. Tolan DJM, Rutter MD, Plumb AA. CT colonography and lower gastrointestinal cancer pathways: planning for the next decade. *Clinical Radiology* [Internet]. 2023 Feb [cited 2023 May 21].
3. Zalis ME, Barish MA, Choi JR, et al. CT colonography reporting and data system: a consensus proposal. *Radiology* 2005;236:3-9.
4. Pickhardt PJ, Correale L, Morra L et al. JOURNAL CLUB: Extracolonic Findings at CT Colonography: Systematic Review and Meta-Analysis. *American Journal of Roentgenology*. 2018 Jul;211(1):25–39.