

# **COLOR ATLAS OF FORENSIC PATHOLOGY**

## Version 1

# **ENDOCRINE SYSTEM**

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Chronic pancreatitis

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#### **FOREWORD**

The greatest pleasure I experience as a teacher, is to see my students excel in their chosen careers and perform even better than myself. The series of e-booklets prepared to better equip medical officers to handle common conditions likely to be encountered in their day to day forensic practice by Professor Dinesh Fernando, is a good example of one of my students doing better than me!

Dinesh is the son of Emeritus Professor of Community Medicine, Former Head, Department of Community Medicine, Former Dean, Faculty of Medicine and Vice Chancellor of the University of Peradeniya, Malcolm Fernando, who was an illustrious medical academic. Following his father's footsteps, he joined the University of Peradeniya in 2003.

Dinesh was one of my post graduate trainees at the Department of Forensic Medicine and Toxicology, Faculty of Medicine, Colombo, and obtained the doctorate in Forensic Medicine in 2003. He underwent post-doctoral training at the Victorian Institute of Forensic Medicine, Melbourne, Australia, with my colleague and contemporary at Guy's Hospital Medical School, University of London, Professor Stephen Cordner. During this period, he served as the honorary forensic pathologist of the Disaster Victim Identification team in Phuket, Thailand following the tsunami, and was awarded an operations medal by the Australian Federal Police.

He has edited, and contributed chapters to, 'Lecture Notes in Forensic Medicine' authored by the former Chief Judicial Medical Officer, Colombo, Dr. L.B.L. de Alwis and contributed to 'Notes on Forensic Medicine and Medical Law' by Dr. Hemamal Jayawardena. He is the editor of the Sri Lanka Journal of Forensic Medicine, Science and Law. Continuing his writing capabilities, he has compiled an important and unique set of e-booklets which will be a great asset to undergraduate and post-graduate students of Forensic Medicine, and also to our colleagues. Its succinct descriptions of complicated medico-legal issues and clear and educational photographs are excellent. It makes it easy for the students to assimilate the theoretical knowledge of each topic as they have been augmented with histories, examination findings, macroscopic and microscopic photographs of actual cases. In some areas, photographs from multiple cases have been included, so that the students can better appreciate the subtle differences that would be encountered in their practice.

I sincerely thank my ever so grateful student Dinesh, for giving me this great honour and privilege to write the foreword.

#### Professor Ravindra Fernando

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Senior Professor of Forensic Medicine, General Sir John Kotelawala Defence University, Ratmalana. Emeritus Professor of Forensic Medicine and Toxicology, Faculty of Medicine, University of Colombo

## About the authors.....

Dr. Dinesh Fernando is a merit Professor in Forensic Medicine at the Faculty of Medicine, University of Peradeniya and honorary Judicial Medical Officer, Teaching Hospital Peradeniya. He obtained his MBBS in 1994 with Second class honours from the North Colombo Medical College, Sri Lanka, and was board certified as a specialist in Forensic Medicine in 2004. He obtained the postgraduate Diploma in Medical Jurisprudence in Pathology from London in 2005, and possesses a certificate of eligibility for specialist registration by the General Medical Council, UK. He underwent post-doctoral training at the Victorian Institute of Forensic Medicine, Melbourne, Australia. He has also worked at the Wellington hospital, New Zealand, as a locum Forensic Pathologist and as an Honorary Clinical Senior Lecturer at the Wellington School of Medicine and Health Sciences, University of Otago, New Zealand. He was invited to visit and share experiences by the Netherlands Forensic Institute in 2019. He was conferred a Fellowship by the College of Forensic Pathologists of Sri Lanka in 2021.

Dr. Samadika Wimalarathne is a Temporary Lecturer at the Department of Forensic Medicine, Faculty of Medicine, University of Peradeniya. She obtained her MBBS in 2022 with Second class honours from the Faculty of Medicine, University of Peradeniya. She received 10 distinctions, including a distinction in Forensic Medicine.

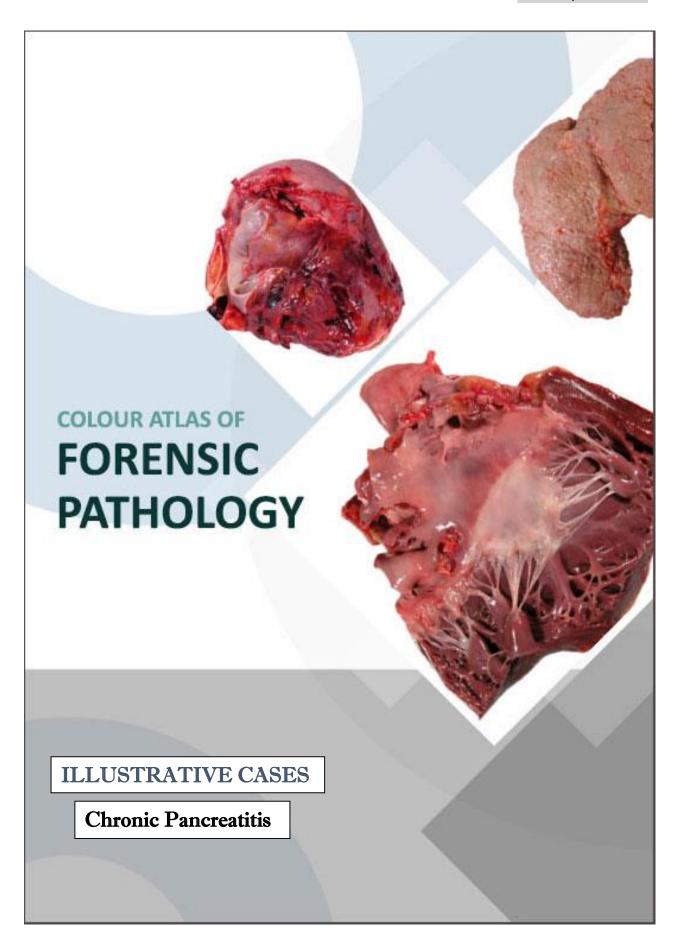
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### **PREFACE**

Forensic Medicine in Sri Lanka encompasses, both, examination of patients for medico-legal purposes and conducting autopsies in all unnatural deaths, in addition to those that the cause of death is not known. In the eyes of the justice system in Sri Lanka, all MBBS qualified medical officers are deemed to be competent to conduct, report and give evidence on medico-legal examinations of patients and autopsies conducted by them, as an expert witness. However, during their undergraduate training, they may not get the opportunity to assist, nor observe, a sufficient variety of representative of cases that may be encountered in the future.

Therefore, a series of e-booklets has been prepared to better equip medical officers to handle common conditions that are likely to be encountered in day to day forensic practice. The case histories, macro and micro images are from cases conducted by Prof. Dinesh Fernando. Prof. Sulochana Wijetunge obtained and reported on the microphotographs. The compilation of the case and photographs for publication was done by Dr. Samadika Wimalarathne. Ms. Chaya Wickramarathne did a yeomen service in design, lay out and formatting the booklet.

The content herein may be used for academic purposes with due credit given. Any clarifications, suggestions, comments or corrections are welcome.



# Chronic Pancreatitis

Chronic pancreatitis is a progressive chronic inflammatory disease of the pancreas, which causes atrophy of the parenchyma and deposition of fibrous tissue, and eventually leads to destruction of both, exocrine and endocrine, components of the pancreatic parenchyma.

The common clinical manifestations include, chronic epigastric pain of mild to moderate severity which can sometimes be severe, diabetes mellitus due to endocrine deficiency and malabsorption and diarrhea due to exocrine deficiency.

Common etiologies leading to chronic pancreatitis are ductal obstruction by gall stones, tumors, chronic alcohol abuse, genetic conditions such as cystic fibrosis, hereditary pancreatitis and autoimmune conditions such as autoimmune pancreatitis and systemic lupus erythematosus.

Although not very common, both acute and chronic pancreatitis can lead to sudden death. Due to the necrosis, blood vessels can be eroded and lead to catastrophic bleeding which may cause sudden death. However sudden deaths are commoner with acute pancreatitis rather than that with chronic pancreatitis. Chronic pancreatitis can lead to pancreatic adenocarcinoma which might be fatal. These patients are more prone to episodes of acute pancreatitis in the background of chronic pancreatitis (acute on chronic pancreatitis) and might develop potentially lethal complications of acute pancreatitis. However chronic pancreatitis may act as a contributory factor and may be found during autopsies as a co-morbidity in cases of deaths due to other causes.

Macroscopic features of chronic pancreatitis include whitish parenchyma with intense fibrosis, and dilated ducts (sometimes with calculi). Fibrotic parenchyma initially retains the lobulated appearance. Later, the volume of the gland is reduced. Typically calcifications in ducts and parenchyma are seen. Pseudocysts are commonly seen in alcoholic pancreatitis, whereas, retention cysts are commonly seen in obstructive pancreatitis.

Among histopathological features, distorted architecture of acini and lobules around which there is a marked increase in connective tissues, is prominent. Later, fibrosis can be seen. Distorted lobular architecture leads to chain of lakes appearance on CT scan.

### History

A 79-year-old male who was generally unwell with undiagnosed medical conditions and was being treated in a full time chronic care facility was admitted to the emergency department due to sudden deterioration of his condition. He died after two days.

#### **Internal Examination**

A moderate enlargement of the heart without coronary artery disease was found. There was a non-ruptured abdominal aortic aneurysm (See Volume 2, aortic diseases, page 6.) Features of peritonitis were seen, associated with a small amount of pus in the peritoneum. Features of chronic pancreatitis were seen with a necrotic nodule on the head of the pancreas which had not caused pancreatic duct obstruction.



Figure 1: Dissection of pancreatic head showing areas of saponification and necrosis.

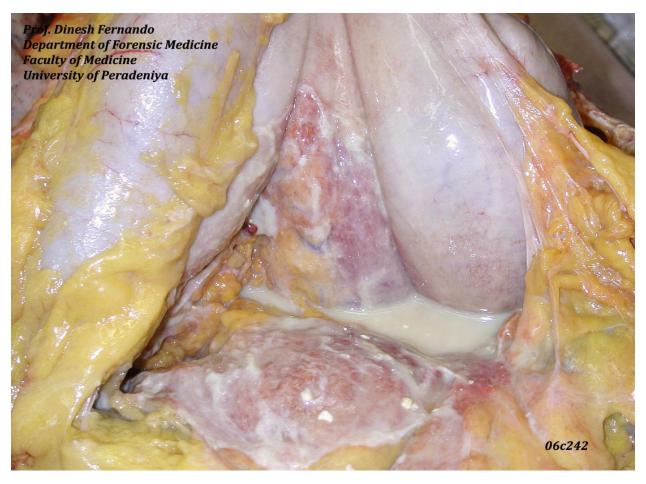


Figure 2: Features of peritonitis with a small amount of pus present in the peritoneal cavity

# Microscopic examination

Sections of the pancreas showed fat necrosis, suppurative necrosis and large number of neutrophils in a background of fibrosis and chronic inflammatory cells. The features are consistent with active chronic pancreatitis.

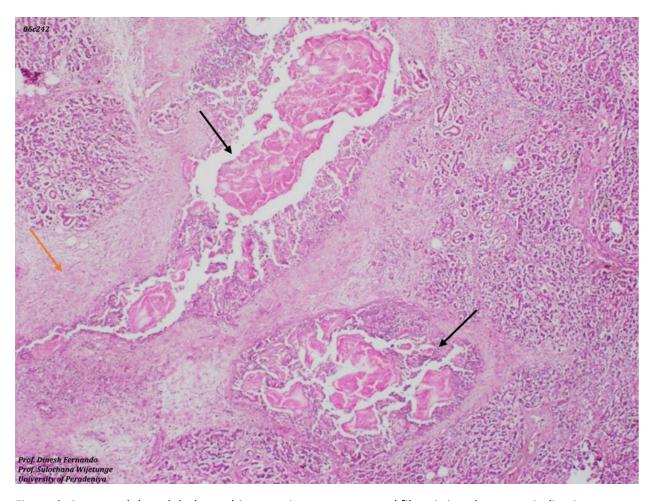


Figure 3: Preserved ductolobular architecture in some areas and fibrosis in other areas indicating chronicity. Black arrows shows distended ducts with concreted secretions. The yellow arrow indicates surrounding fibrosis.

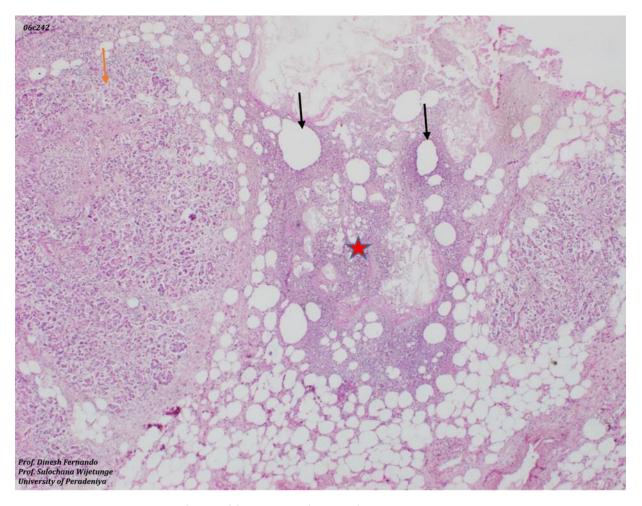


Figure 4: Pancreatitis with a focus of fat necrosis (red star). Note the completely damaged adipose tissue with a few distended residual adipocytes (black arrow). The dark purplish regions are the calcium deposits. Orange arrow indicates partially damaged pancreatic acini.

# Cause of death

Active chronic pancreatitis.

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