Giornata Regionale
SIDS, SIUD & ALTE
2011

La morte in culla, la morte del feto
a termine di gravidanza e gli eventi apparentemente
minacciosi per la vita del lattante
Aspetti scientifici e sociali

BACK TO SLEEP

26 novembre 2011

Sala conferenze CAMeC
Piazza Cesare Battisti, 1 - La Spezia

SIDS

è primariamente

una diagnosi di

ESCLUSIONE

Tabella 3. Diagnosi differenziale della sindrome da morte improvvisa infantile
Aspirazione, asfissia, annegamento
Patologie cardiache (es. aritmie, alterazioni strutturali)
Alterazioni elettrolitiche o disidratazione
Difetti congeniti del metabolismo
Infezioni (es. meningite, sepsi, polmonite)
Avvelenamenti
Traumi

SIDS

è primariamente

una diagnosi di

ESCLUSIONE

Ipotesi di reato

Svariate cause patologiche

SIDS

è primariamente una diagnosi di

ESCLUSIONE

Livelli diagnostici progressivi per raffinare le diagnosi

The Royal College of Pathologists

Guidelines on Autopsy Practice

Scenario 8: Sudden unexpected deaths in infancy (SUDI)

The role of the autopsy

- To establish whether the death is attributable to a natural disease process (infection, metabolic disorder, congenital abnormalities).
- To consider the possibility of accidental death (trauma, poisoning, scalding, drowning).
- To consider the possibility of asphyxia/airway obstruction.
- To consider the possibility of non-accidental injury.
- To document the presence/absence of pathological processes and to contribute to the multidisciplinary clinicopathological evaluation of the death.

Note that these autopsy reports will be anonymously submitted to the Confidential Enquiry into Maternal and Child Health (CEMACH) in England and Wales, and in Scotland to SUDI case review conferences, coordinated by the Scottish Cot Death Trust.

I

Si rendono necessari protocolli specifici che superino le normali tecniche settorie applicate in patologia perinatale.

II

Causa mortis
e
segni della morte

Il “ come si muore” ed i “segni della morte” non devono rappresentare elementi confondenti le vere cause di morte vale a dire il “perchè è morto” .

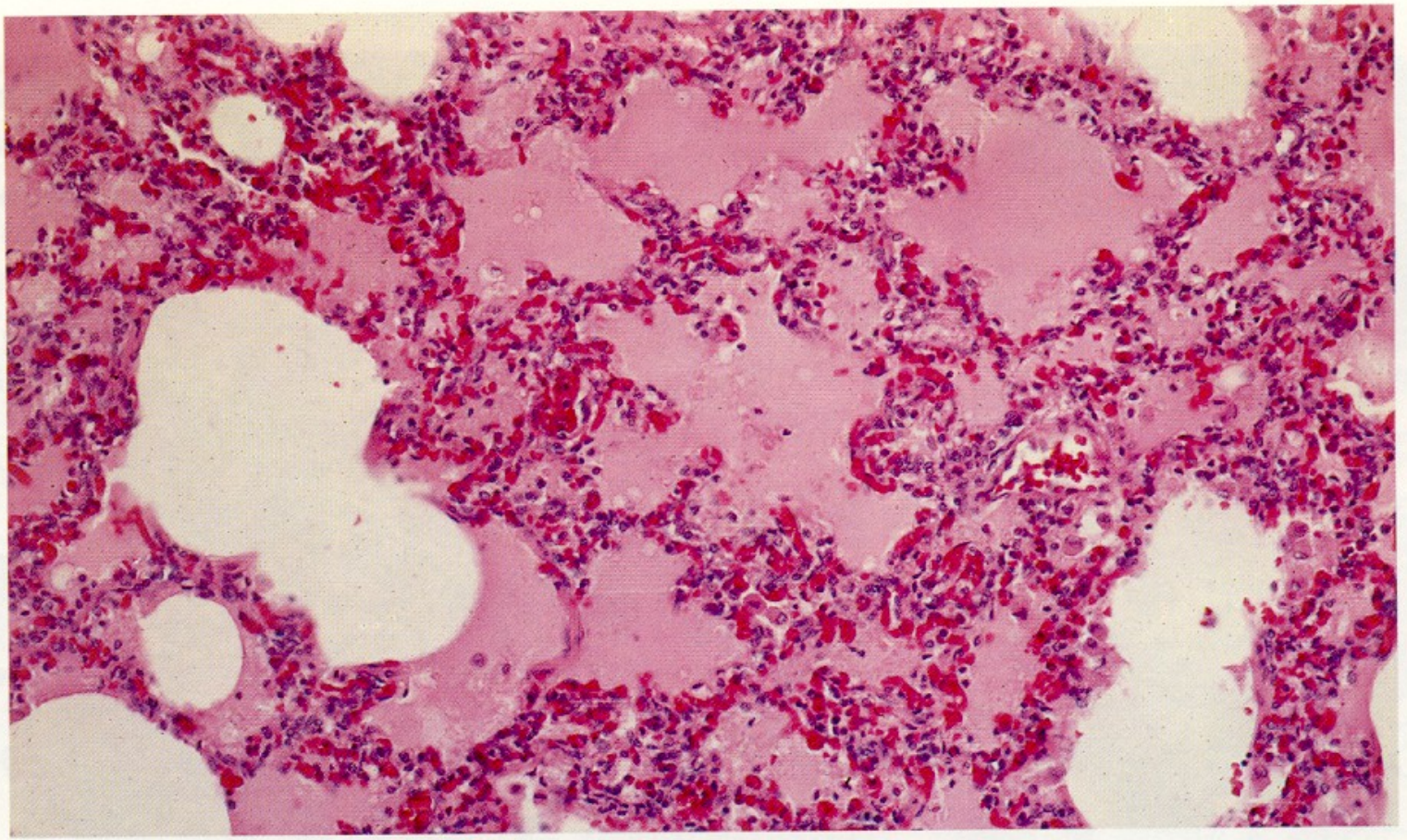


Figure 5–9. Pulmonary edema, moderate to marked. 160x

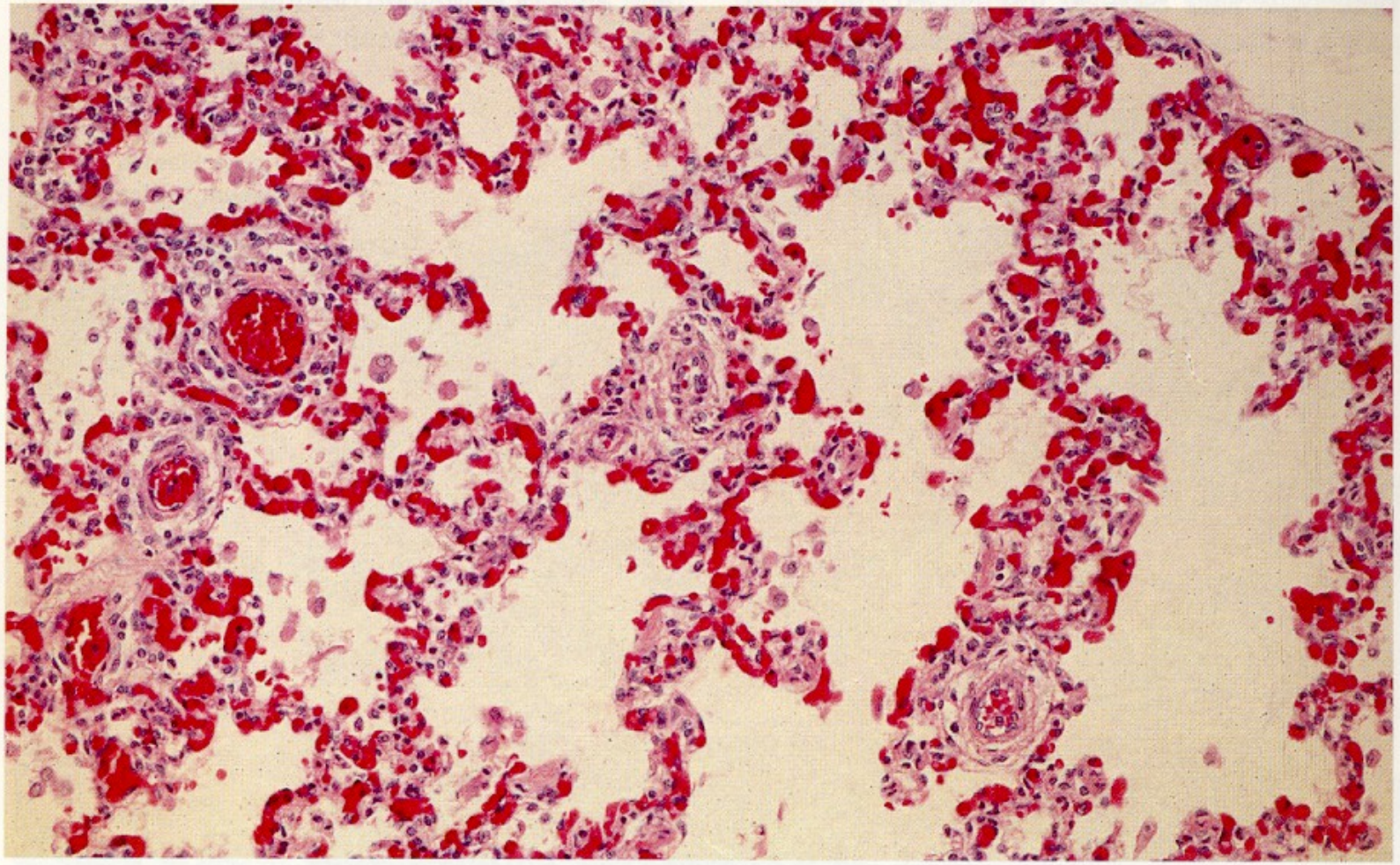


Figure 5–6. Pulmonary congestion of a mild to moderate degree. 160x

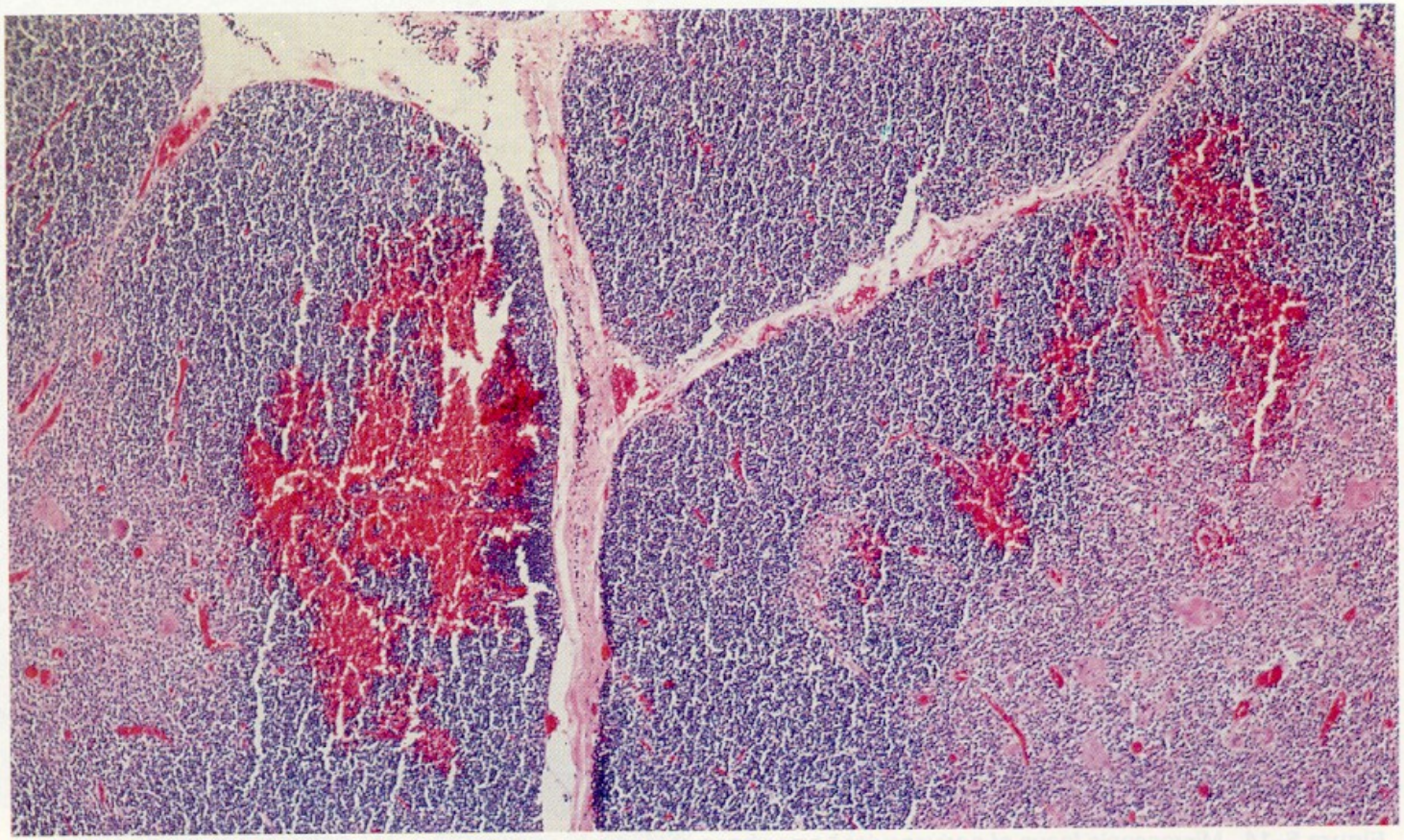


Figure 5–13. Thymic petechiae. 60x

III

Identificazione di cause patologiche molto specifiche e peculiari per l'età neonatale

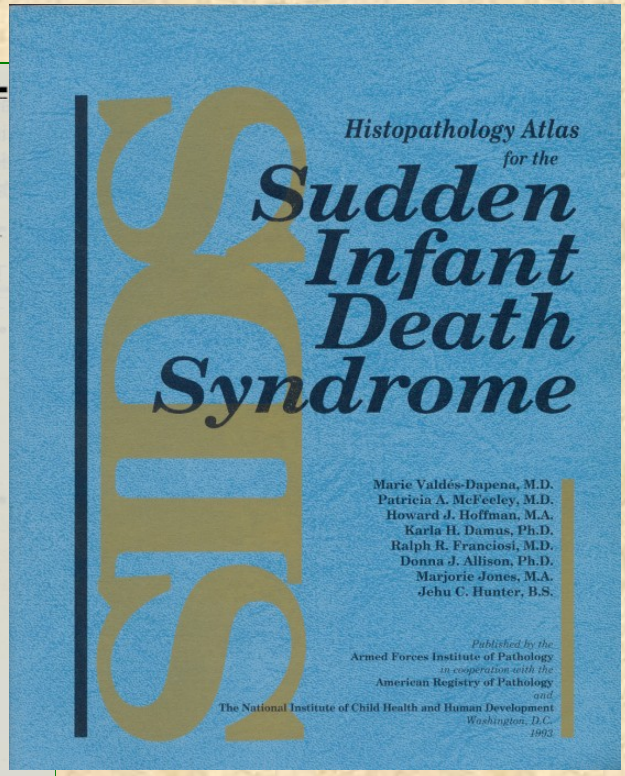
Iter diagnostico particolare

Protocolli specifici

Diagnostica di livello specialistico

Table 6–2. **Explained Causes of Sudden Death in Infants Classified by Anatomical Site of Mortal Lesion**

- **Cardiovascular**
  - Myocarditis (usually viral)
  - Congenital heart disease
    - -Congenital aortic valvular stenosis
    - -Endocardial fibroelastosis
    - -Anomalous origin of the left coronary artery
  - Cardiomyopathy
  - Rhabdomyoma (especially in tuberous sclerosis)
  - Coronary arteritis (Kawasaki's disease)
- **Respiratory**
  - Upper airway obstruction
  - Bronchopneumonia
  - Bronchiolitis, severe
- **Gastrointestinal Tract**
  - Cystic remnant of thyroglossal duct in the base of the tongue (causing obstruction to the airway)
  - Enterocolitis with diarrhea, dehydration and/or fluid and electrolyte imbalance
- **Pancreas**
  - Cystic fibrosis of the pancreas (with overheating)
- **Endocrine**
  - Congenital adrenal hypo- or hyperplasia
- **Central Nervous System**
  - Trauma
    - -Cerebral edema secondary to trauma
    - -Subdural hematoma
  - Meningitis
  - Encephalitis
  - Arteriovenous malformation
- **Systemic**
  - Dehydration
  - Cervical cellulitis (Ludwig's angina)
  - Poisoning (carbon monoxide)
  - Overheating (especially in infants with cystic fibrosis)



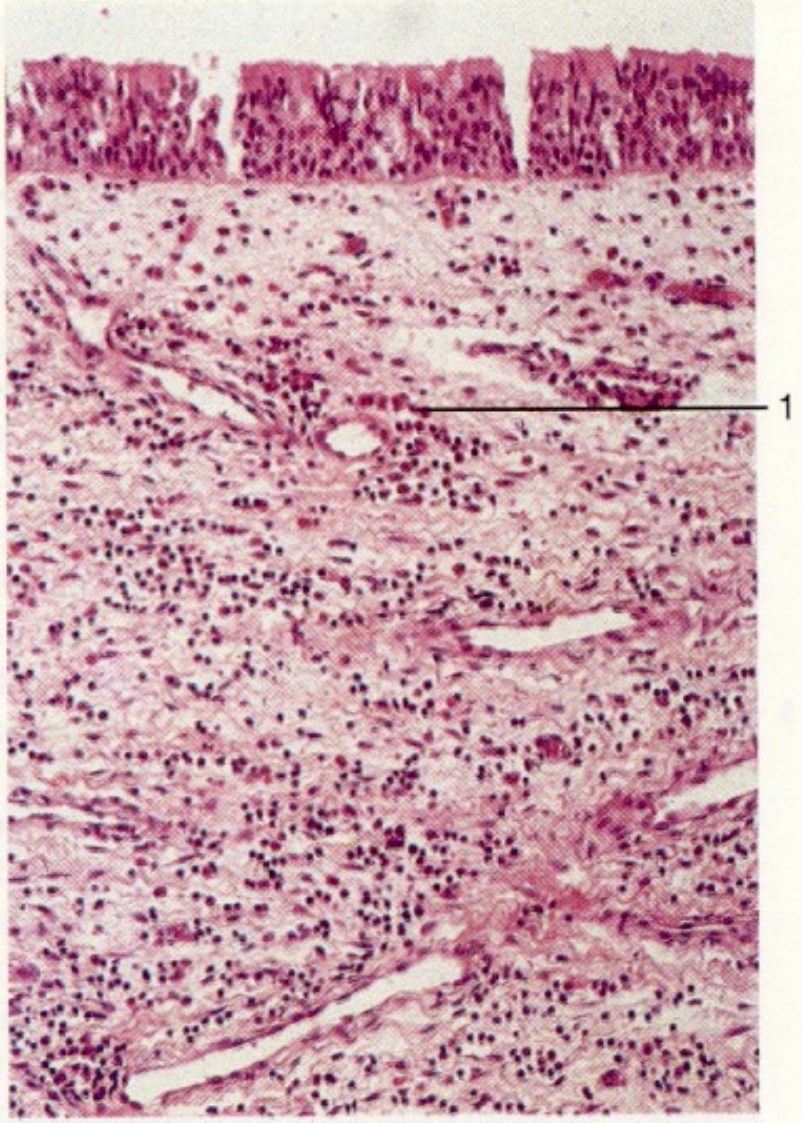


Fig. 15.12. *SIDS. Inflammation of the mucosa of the nasal passages. H & E, 128×.*

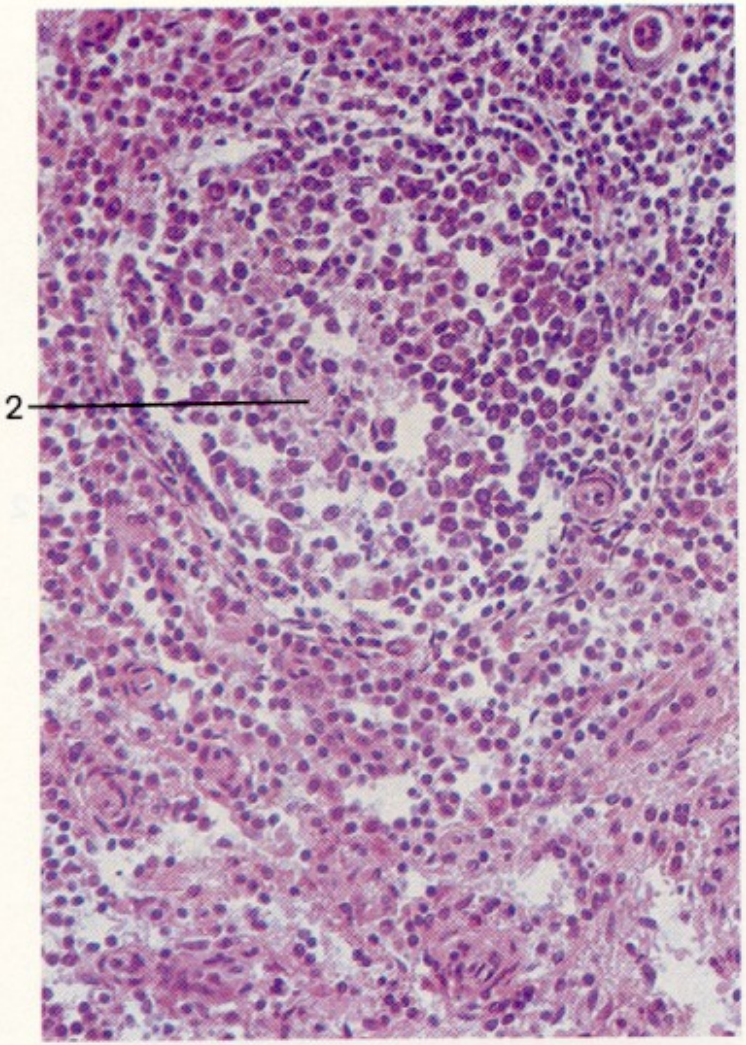
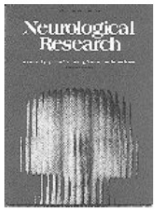


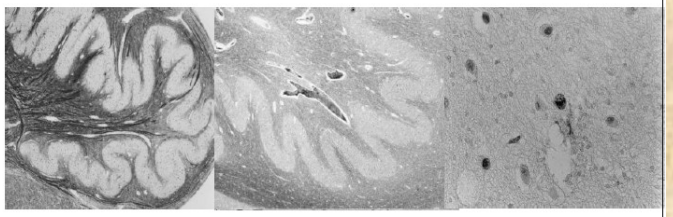
Fig. 15.13. *SIDS. Necrosis of the germinal center in a malpighian corpuscle of the spleen. H & E, 80×.*

IV

Identificazione di cause patologiche rare

rete di diagnostica integrata di secondo livello

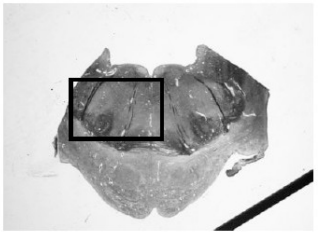


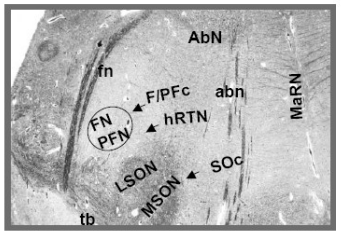


A.M. Lavezzi, G. Ottaviani, M. Mauri, L. Matturri.

Biopathology of the olivocerebellar network in sudden unexplained perinatal and sudden infant death syndrome related to maternal cigarette smoking.

Neurol Res 2007, 29(6): 525-532.

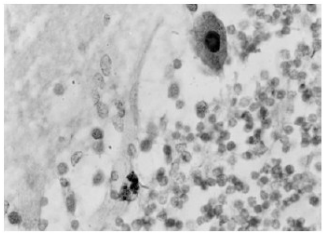


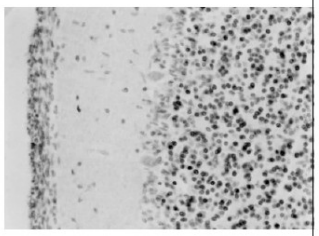


Lavezzi A.M., Wees-Mayer D.E., Yu M.Y., Casale V, Corna M.F., Oneda R., Matturri L.

The human retrotrapezoid nucleus: congenital alterations in sudden infant death syndrome and sudden intrauterine unexplained death.

In press...

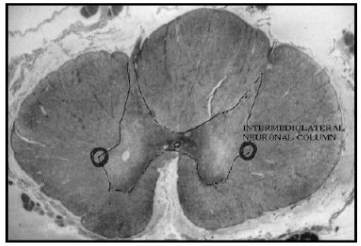


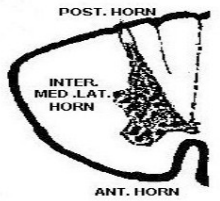


AM. Lavezzi, G. Ottaviani, M. Mauri, L. Matturri.

Alterations of biological features of the cerebellum in sudden perinatal and infant death.

Curr Mol Med 2006; 6: 429-435

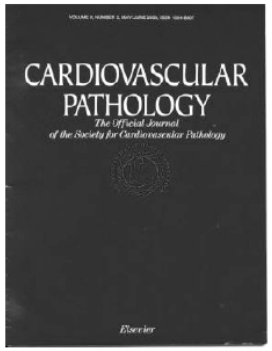




Lavezzi A.M., Corna M.F., Hehboob R., Matturri L.

Neuropathology of the intermediolateral nucleus of the spinal cord in sudden unexplained perinatal and infant death.

Int J Devl Neuroscience 2010, 28: 133-138



G. Ottaviani, L. Rossi, SG. Ramos, L. Matturri.

Pathology of the Heart and Conduction System in a case of Sudden Death due to a Cardiac Fibroma in a 6-month-old child.

Cardiovasc Pathol 1999; 8: 109-112

G.Ottaviani, L.Matturri, L.Rossi, AM.Lavezzi, T.N.James

Multifocal Cardiac Purkinje Cell Tumor in Infants.

Europace 2004; 6: 138-141

Am J Forensic Med Pathol. 2011 Dec;32(4):331-5.
Numerous cortical tubers and rhabdomyomas in a case of sudden unexpected infant death.
Izevbaye I, Sun J, Fazlollah L.
From the Department of Pathology, State University of New York at Buffalo, Buffalo, NY.

Am J Forensic Med Pathol. 2011 Aug 3. [Epub ahead of print]
Death of a 6-Month-Old Due to a Tracheal Bronchus.
Hansen-Welches L, Slabach R, Landrum JE, Prahlow JA.
From the *Indiana University School of Medicine, Indianapolis, IN; †Department of Anesthesiology, Georgetown University Hospital, Washington, DC; ‡Elkhart County Coroner, Elkhart; §Indiana University School of Medicine-South Bend at the University of Notre Dame; and ‖South Bend Medical Foundation, South Bend, IN

Acta Paediatr. 2011 Jul 18. doi: 10.1111/j.1651-2227.2011.02413.x. [Epub ahead of print]
Gliosis in neonatal SUDI cases.
Chiu M, Elder D, Zuccollo J.
Medical Student, University of Otago, Wellington, New Zealand Department of Paediatrics & Child Health, University of Otago, Wellington, New Zealand Department Obstetrics & Gynaecology, University of Otago, Wellington, New Zealand

Ups J Med Sci. 2011 August; 116(3): 220.
Features of diaphragmatic myositis in a case of sudden infant death
Michael Eisenhut
Luton & Dunstable Hospital NHS Foundation Trust, Luton, United Kingdom

Ann Pathol. 2011 Apr; 31(2):93-7.
[A rare cause of sudden cardiac failure: histiocytoid cardiomyopathy].
Coulibaly B, Piercecchi-Marti MD, Fernandez C, Wasier AP, Viard L, Fraisse A, Figarella-Branger D, Leonetti G, Camboulives J, Paut O.
Service d'anatomie pathologique et de neuropathologie, CHU Timone,, Marseille, France.

Pediatr Pulmonol. 2011 Oct;46(10):1041-4. doi: 10.1002/ppul.21463. Epub 2011 Apr 25.
Portopulmonary hypertension secondary to congenital extrahepatic portosystemic shunt with heterotaxy and polysplenia: a cause of sudden death in an infant.
Kobayashi D, Edwards HD, Singh J, Nadkarni MD, Lantz PE, Cook AL.
Department of Pediatrics, Wake Forest University School of Medicine, Winston-Salem, North Carolina.

Am J Forensic Med Pathol. 2011 Jun;32(2):166-8.
Large multifocal cardiac myxoma causing the sudden unexpected death of a 2-month-old infant--a rapidly growing, acquired lesion versus a congenital process?: a case report.
Kure K, Lingamfelter D, Taboada E.
University of Missouri-Kansas City and Truman Medical Centers, Kansas City, MO, USA.

Nel 2011

pubblicati 115 lavori sulla

SIDS

V

Identificazione di cause patologiche molto particolari

Centro di riferimento diagnostico regionale

Table 10–4. **Histopathological Findings Based on the Pathology Study Panel Review of Microscopic Slides for Singleton SIDS Cases and Explained Deaths** [a, b]

	SIDS Cases %	Explained Deaths %
Epiglottis		
Normal	59	49
Inflammation	40	48
Trachea		
Normal	70	55 **
Inflammation	29	45 **
Denuded epithelium	10	13
Neutrophils	<1	<1
Thick basement membrane	<1	<1
Adventitial hemorrhage	<1	<1
Thyroid		
Normal	98	98
Thymus		
Normal	56	64
Petechiae	44	25 **
Lung		
Normal	10	13
Congestion	89	80 **
Alveolar hemorrhage	66	54 *
Edema	63	51 *
Septal hemorrhage	30	13 **
Macrophages	15	18
Emphysema	14	18
Pleural hemorrhage	13	5 *
Bronchiolitis	10	26 **
Poor inflation/atelectasis	7	16 **
Aspiration	10	13
Bronchitis	8	13
Pneumonia	8	34 **
Alveolar collapse	10	12
Postmortem bacterial colonies	5	4
Pneumonitis	4	7
Resuscitative changes	1	2
Granuloma	<1	<1

Table 10–4 *Continued*

	SIDS Cases %	Explained Deaths %
Heart		
Normal	95	92
Endocardial thickening	2	2
Petechiae	3	3
Lymphocytic infiltrate	<1	<1
Interstitial hemorrhage, pericapillary	<1	<1
Diaphragm		
Normal	98	98
Gastroesophageal Junction		
Normal	85	81
Inflammation	12	11
Cellular infiltrate	<1	<1
Liver		
Normal	45	36
Congestion	35	35
Extramedullary hematopoiesis	23	14 *
Fatty change	8	19 **
Triaditis	5	3
Abnormal glycogen	1	2
Hepatitis	1	2
Hepatocellular necrosis	<1	2
Focal inflammation	<1	<1
Portal fibrosis	<1	1
Sinus leukocytes	<1	<1
Foamy vacuolization	<1	<1
Hemangioma	<1	<1
Pancreas		
Normal	88	82
Islet cell hyperplasia	6	10
Cystic fibrosis	<1	<1
Spleen		
Normal	76	63 **
Congestion	18	27 *
Acute splenitis	2	7 **
Hemosiderosis	<1	1
Extramedullary hematopoiesis	<1	1

	SIDS Cases %	Explained Deaths %
Adrenal		
Normal	59	59
Congestion	40	35
Brown fat present, periadrenal	74	74
Hemorrhage	3	4
Lipid depletion	1	2
Kidney		
Normal	63	58
Congestion	26	30
Relative immaturity	7	7
Calcium deposits	4	8
Pyelonephritis	<1	<1
Vacuolization of proximal tubular epithelium	<1	<1
Ileum		
Normal	95	91
Lymphoid hyperplasia	3	10 **
Eosinophilic infiltrate	<1	1
Lymphoid depletion	<1	<1
Mesenteric Lymph Node		
Normal	93	82 **
Lymphocytic depletion	1	4
Congestion	<1	1
Acute adenitis	<1	3
Blood		
Normal	97	91 **
Sickled cells	<1	3

	SIDS Cases %	Explained Deaths %
Brain		
Encephalitis	1	<1
Meningitis	<1	6 **
Edema	<1	1
Abcess	<1	<1
Inflammation	<1	<1
Excess subependymal neural nests	<1	<1
Normal	90	84
Congestion	28	27
Perivascular hemorrhage	17	16
Petechiae	16	17
Calcification	3	6
Hypoxic changes	2	6 **
Relative immaturity	<1	<1

Possono essere cause concomitanti o associate ciascuna può essere necessaria ma non sufficiente

Centro diagnostico molto dedicato che effettua autopsie secondo specifici protocolli e in tempi corretti tali consentire la raccolta delle informazioni.

Sudden unexpected death in infancy

A multi-agency protocol for care and investigation

The report of a working group convened by The Royal College of Pathologists and The Royal College of Paediatrics and Child Health

Chair: The Baroness Helena Kennedy QC

This document received input from many stakeholders (see Appendices V and VI) and was discussed and approved by the Councils of both The Royal College of Pathologists and The Royal College of Paediatrics and Child Health. In accordance with the publications policy of The Royal College of Pathologists, the document was placed on the Fellows and Members Area of their website from 25 June to 16 July 2004 for consultation. To date, 15 detailed replies were received and forwarded to the members of the Working Group, who found them very helpful in preparing this final report. Inevitably, given the nature and sensitivity of the subject, some contentious issues remain. The Working Group expects that the protocol will be further refined in future and welcomes feedback from those who use it. Comments should be sent to publications@rcpath.org with 'SUDI' in the subject line.

Professor John A Lee
Director of Publications, The Royal College of Pathologists

Further copies of this publication can be obtained from the Colleges' websites, www.rcpath.org and www.rcpch.ac.uk

Royal College of Obstetricians and Gynaecologists

Setting standards to improve women's health

Green-top Guideline No. 55

October 2010

Late Intrauterine Fetal Death and Stillbirth

NHS Evidence
accredited provider

SUDC PROGRAM

The Sudden Unexplained Death In Childhood Program

...an Answer When There's No Explanation

I. Microscopic sections (in addition to routine sections of heart, lung, etc.)

- **a. Representative sections of brain including**
  1. **Bilateral Hippocampus**
  2. **Midbrain**
  3. **Pons**
  4. **Rostral Medulla**
  5. **Cerebellum including Dentate**
  6. **Basal Ganglia**
  7. **Watershed Cortex**
- **b. Thymus**
- **c. Gastro-esophageal junction for signs of GER**

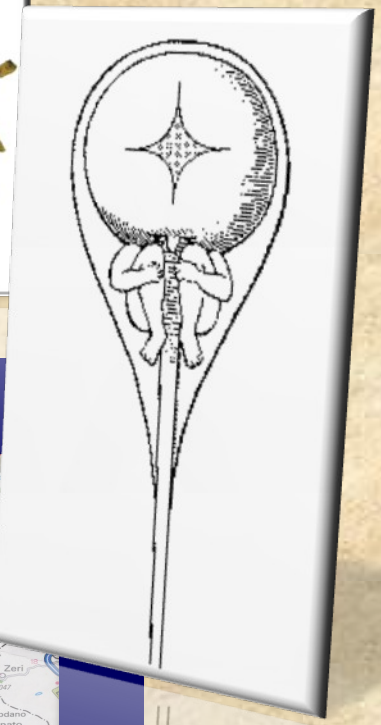
II. Retain as much brain tissue as possible in formalin

III. Specimens for ancillary testing

a. Blood & bile spots for metabolic testing
b. Urine and/or blood for toxicology
c. Vitreous electrolytes, VUN, creatinine
d. Microbiology specimens for culture/PCR when indicated
e. Fresh frozen tissue for further metabolic studies or genetic studies (including channelopathies)

IV. Radiographs, preferably a detailed skeletal series and photographs as indicate


OSPITALIS PAMMATONI




Istituto Giannina Gaslini


1. Presidio Osp. di San Remo
2. Presidio Osp. di Imperia
3. A.O. Ospedale Santa Corona
4. Osp. San Paolo
5. Osp. di Sestri Ponente
6. Osp. Civile di Genova Sampierdarena
7. E.O. Ospedali Galliera
8. A.O. Osp. San Martino
9. Istituto Giannina Gaslini
10. Osp. Civile di Sestri Levante
11. Osp. Civile S. Andrea
GÉNOVA
SAVONA
IMPÉRIA
San Remo
LA SPÉZIA

1.A – PRELIEVI DA EFFETTUARSI PRIMA DEL RISCONTRO AUTOPTICO:

1.A.1) Per coltura microbiologica:

a) Un tampone nasale per ciascuna narice

b) Un tampone del cavo orale

c) Un tampone anale

d) Un campione di liquor cefalo-rachidiano ottenuto sterilmente con puntura lombare

1.A.2. – Per esami batteriologici o virologici:

1) Un campione di sangue

2) Un campione di midollo osseo ottenuto mediante puntato sternale o biopsia della cresta iliaca

3) Un campione di contenuto gastrico

4) Un campione di feci

5) Tampone faringeo

6) Tampone bronchiale

7) Tampone polmonare

Infection. 2011 Dec;39(6):545-8. Epub 2011 Jul 20.

The respiratory pathology in infants with sudden unexpected deaths in whom respiratory specimens were initially PCR-positive or PCR-negative for Bordetella pertussis.

Cherry JD, Paddock CD, Greer PW, Heininger U.

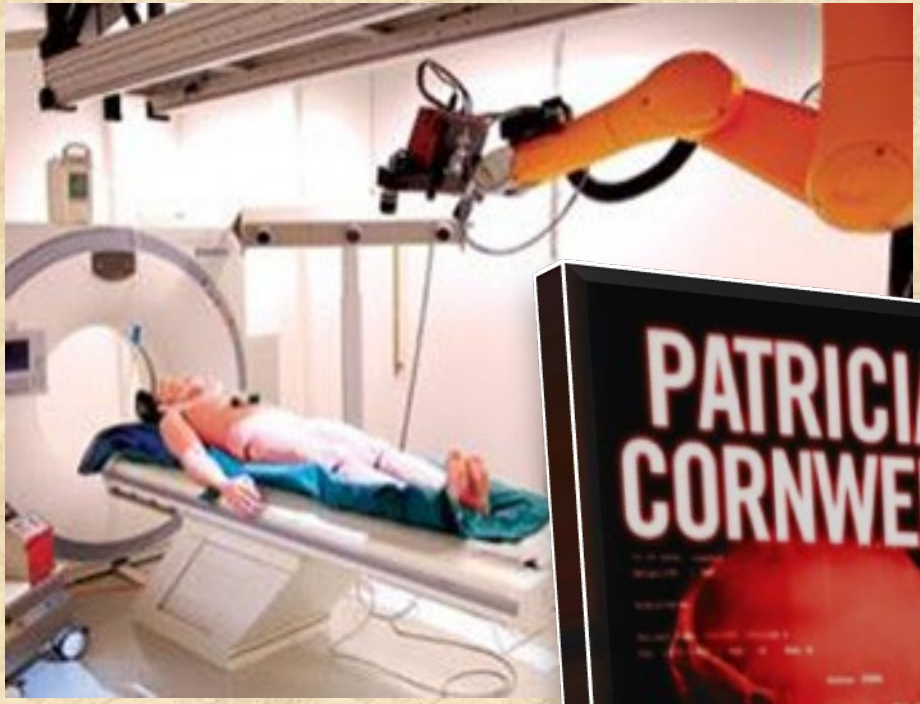
Department of Pediatrics, Division of Infectious Diseases, David Geffen School of Medicine at UCLA,

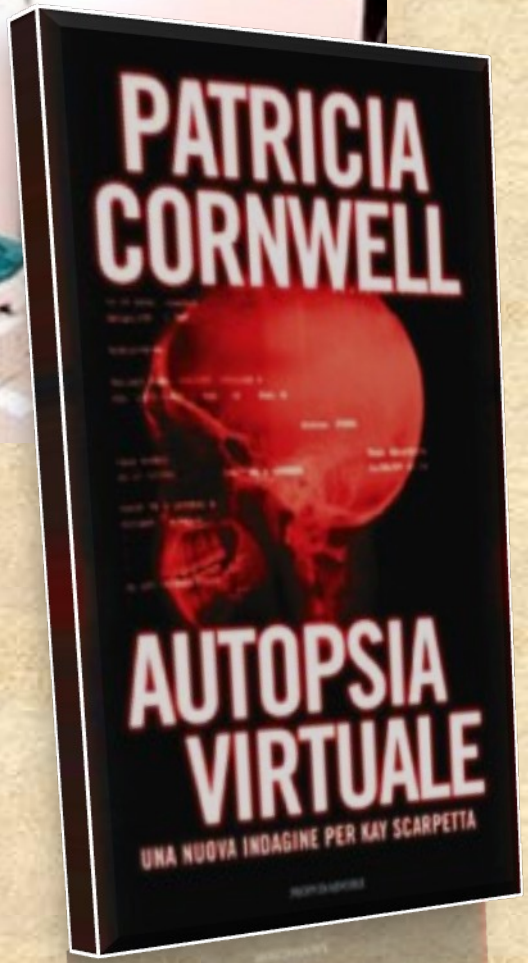
Mattel Children's Hospital UCLA, Los Angeles, CA, 90095, USA.

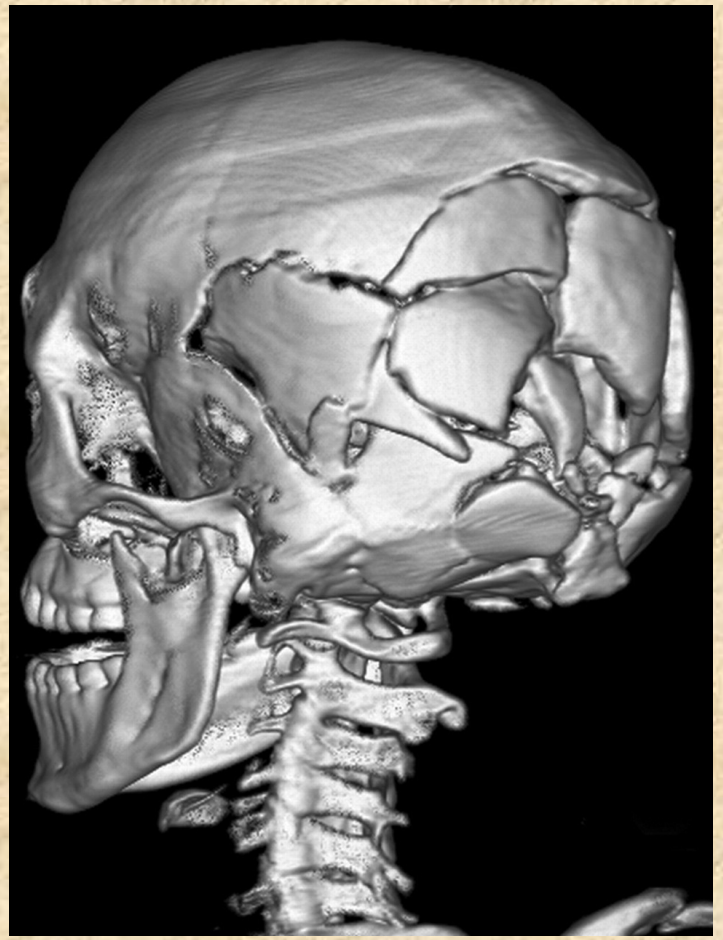
1.B. – PRELIEVI DA EFFETTUARSI IN CORSO DI AUTOPSIA PRIMA DELLA RIMOZIONE O ALL'ATTO DELL'APERTURA DEGLI ORGANI:

1.B.1. – Per esami tossicologici:

1) Un campione di contenuto gastrico
2) Un campione di materiale digesto presente nel duodeno
3) Un campione di materiale alimentare contenuto nell'ileo
4) Un campione di feci
5) Un campione di bile
6) Un campione di urina
7) Un campione di sangue




PATRICIA
CORNWELL
AUTOPSIA
VIRTUALE
UNA NUOVA INDAGINE PER KAY SCARPETTA



1.B.2. – Per indagine genetica:

•*Per la ricerca di polimorfismi genetici:*

Fissare in etanolo 90°-95° frammenti delle dimensioni di circa 0,5 cm^3 dei seguenti organi, da conservare a temperatura ambiente:

1.midollo allungato (il frammento deve essere prelevato al di sotto dell'oliva inferiore, mantenendo l'integrità della porzione superiore, al fine di consentire l'esame istopatologico su sezioni seriate)

2.corteccia cerebellare

3.corteccia cerebrale in zona parietale

4.parenchima epatico

5.miocardio comune

6.muscolo striato

•*Per lo studio delle varianti della sindrome del Q-T lungo*

1) Un campione di sangue (congelato a –20°C)

2) Un campione di milza (congelato a –20°C)

Yonsei Med J. 2011 Nov 1;52(6):1035-8. doi: 10.3349/ymj.2011.52.6.1035.
Prenatal Diagnosis of Congenital Lipoid Adrenal Hyperplasia (CLAH) by Molecular Genetic Testing in Korean Siblings.
Ko HS, Lee S, Chae H, Choi SK, Kim M, Park IY, Suh BK, Shin JC.
Department of Obstetrics and Gynecology, College of Medicine, The Catholic University of Korea, 505 Banpo-dong, Seocho-gu, Seoul 137-450, Korea

Am J Med Genet A. 2011 Oct;155A(10):2512-5.
Report of a further family with dominant deafness-onychodystrophy (DDOD) syndrome.
White SM, Fahey M.
Genetic Health Services Victoria, Royal Children's Hospital, Parkville, Australia.

Circ Cardiovasc Genet. 2011 Oct 1;4(5):510-5. Epub 2011 Aug 11.
Loss-of-Function Mutations in the KCNJ8-Encoded Kir6.1 KATP Channel and Sudden Infant Death Syndrome.
Tester DJ, Tan BH, Medeiros-Domingo A, Song C, Makielski JC, Ackerman MJ
Departments of Medicine

Cardiology. 2011;119(1):21-33. Epub 2011 Jul 16.
Cardiac channelopathies and sudden infant death syndrome.
Tfelt-Hansen J, Winkel BG, Grunnet M, Jespersen T.
Danish National Research Foundation Centre for Cardiac Arrhythmia (DARC), Copenhagen, Denmark

Physiol Genomics. 2011 Aug 24;43(16):974-80. Epub 2011 Jun 21.
Gene expression analysis characterizes antemortem stress and has implications for establishing cause of death.
Jardine D, Cornel L, Emond M.
Department of Pediatrics, University of Washington, Seattle, WA 98195, USA.

1.B.3 – Per indagini metaboliche:

1) Urina in una provetta sterile. Anche una quantità (0,1 ml) può essere sufficiente. Se la vescica è vuota e non si riesce a raccogliere l'urina è necessario strofinare delicatamente sulla parete vescicale 2 tamponi di cotone finchè siano visibilmente bagnati e conservarli in provette sterili.

Il campione di urina o i tamponi vanno congelati a –20°C appena possibile o stoccati in B.I.T.-T

2) Circa 10 ml di sangue raccolto in provetta di plastica contenente EDTA. Congelare al più presto a –20°C o stoccare in B.I.T.-T

3) Un frammento di fegato (indicativamente un cubo di 2-2,5 cm di lato) congelato ed avvolto in foglio di alluminio a –20° C o stoccato in B.I.T.-T

4) Un frammento di muscolo scheletrico (indicativamente un cubo di 2-2,5 cm di lato) congelato ed avvolto in foglio di alluminio a –20° C o stoccato in B.I.T.-T

Molecular Genetics and Metabolism 102 (2011) 399–406

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journal homepage: www.elsevier.com/locate/ymgme

Retrospective review of Japanese sudden unexpected death in infancy: The importance of metabolic autopsy and expanded newborn screening

Takuma Yamamoto [a], Hidekazu Tanaka [b,*], Hironori Kobayashi [c], Ko Okamura [a], Tatsuya Tanaka [d], Yuko Emoto [a], Kana Sugimoto [a,1], Masato Nakatome [a,2], Norio Sakai [e], Hisanaga Kuroki [a,3], Seiji Yamaguchi [c], Ryoji Matoba [a]

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[b] Department of Pharmacology, Osaka University Graduate School of Medicine, 2-2 Yamada-Oka, Suita, Osaka 565-0871, Japan
[c] Department of Pediatrics, Shimane University Faculty of Medicine, 89-1 En-ya, Izumo, Shimane 693-8501, Japan
[d] Center for Medical Research and Education, Osaka University Graduate School of Medicine, 2-2 Yamada-Oka, Suita, Osaka 565-0871, Japan
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Metabolic autopsy
Expanded newborn screening
Carnitine palmitoyltransferase II deficiency

ABSTRACT

Sudden unexpected death in infancy is defined as sudden unexpected death occurring before 12 months of age. The common causes of sudden unexpected death in infancy are infection, cardiovascular anomaly, child abuse, and metabolic disorders. However, the many potential inherited metabolic disorders are difficult to diagnose at autopsy and may therefore be underdiagnosed as a cause of sudden unexpected death in infancy. In the present study we retrospectively reviewed 30 Japanese sudden unexpected death in infancy cases encountered between 2006 and 2009 at our institute. With postmortem blood acylcarnitine analysis and histological examination of the liver, we found two cases of long-chain fatty acid oxidation defects. Molecular analysis revealed that the one patient had a compound heterozygote for a novel mutation (p.L644S) and a disease-causing mutation (p.F383Y) in the *carnitine palmitoyltransferase 2* gene. Furthermore, retrospective acylcarnitine analysis of the newborn screening card of this patient was consistent with carnitine palmitoyltransferase II deficiency. Metabolic autopsy and expanded newborn screening would be helpful for forensic scientists and pediatricians to diagnose fatty acid oxidation disorders and prevent sudden unexpected death in infancy.

J Clin Pathol. 2011 Nov;64(11):1005-9.
Tandem mass spectrometry findings at autopsy for detection of metabolic disease in infant deaths: postmortem changes and confounding factors.
Pryce JW, Weber MA, Heales S, Malone M, Sebire NJ.
UCL Institute of Child Health, Great Ormond Street Hospital for Children, London, UK

Forensic Sci Int. 2011 Jul 15;210(1-3):e1-3. Epub 2011 Apr 30.
Very long-chain acyl CoA dehydrogenase deficiency which was accepted as infanticide.
Eminoglu TF, Tumer L, Okur I, Ezgu FS, Biberoglu G, Hasanoglu A.

Gazi University Hospital, Department of Pediatric Nutrition and Metabolism, Ankara, Turkey.

1.B.4. – Per indagine gas cromatografia:

• *Per la ricerca di componenti del fumo di sigaretta (nicotina e cotonina)*

Una ciocca di capelli della vittima e possibilmente ciocche di capelli di entrambi i genitori in provette di vetro separate e ben sigillate, da conservare a temperatura ambiente.

Childs Nerv Syst.2011 Nov;27(11):1979-83. Epub 2011 Jul 9.
Severe intra- and periventricular hemorrhage: role of arteriolosclerosis related to maternal smoke.
Matturri L, Mecchia D, Lavezzi AM.
Lino Rossi Research Center for the Study and Prevention of Unexpected Perinatal Death and SIDS-Department of Surgical, Reconstructive and Diagnostic Sciences, University of Milan, Milan, Italy.

BMC Pediatr. 2011 Jul 6;11:62.
Brain iron accumulation in unexplained fetal and infant death victims with smoker mothers--the possible involvement of maternal methemoglobinemia.
Lavezzi AM, Mohorovic L, Alfonsi G, Corna MF, Matturri L.
Lino Rossi Research Center for The Study and Prevention of Unexpected Perinatal Death and SIDS, Department of Surgical, Reconstructive and Diagnostic Sciences, University of Milan, Italy.

1.C – IL RISCONTRO DIAGNOSTICO

L’autopsia deve essere completa seguendo i protocolli e le istruzioni operative codificate a livello internazionale.

Ogni organo deve essere esaminato macroscopicamente e campionato per l’esame istologico.

In particolare, nel caso di sospetta S.I.D.S. dovranno essere prelevati con particolare cura:

1.C.1.- Encefalo in toto così da consentire prelievi mirati su:

1) Tronco encefalico per lo studio dei nuclei arcuati

2) Sezioni seriate del bulbo (per lo studio dei centri di regolazione cardiorespiratori)

3) Prelievi a livello della corteccia frontale bilateralmente

4) Prelievi dei nuclei della base

-

1.C.2. – Cuore in toto senza effettuare dissezioni così da consentire prelievi mirati secondo protocollo per :

A) Lo studio di eventuali malformazioni cardiache

B) Lo studio della conduzione cardiaca

1.C.3. – Vasi:

1) Segmenti a livello di strutture del SNA (ganglio stellato e glomo carotideo)

2) Segmenti bilaterali della biforcazione delle carotidi

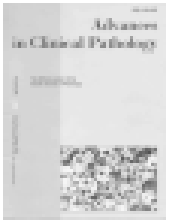
Punti chiave

Sistema Nervoso Centrale

L. Matturri, G. Ottaviani, L. Rossi

Sudden and Unexpected Death due to an Hemangioendothelioma located in the Medulla Oblongata: a Case Report.

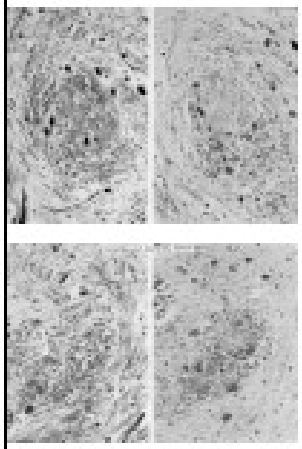
Adv Clin Path 1999; 3: 29-33



L.Matturri, G.Ottaviani, S.G.Ramos, B.Biondo, L.Rossi

Discrete T-lymphocitic Leptomeningitis of the Ventral Medullary Surface in a Case of Sudden Unexpected Infant Death.

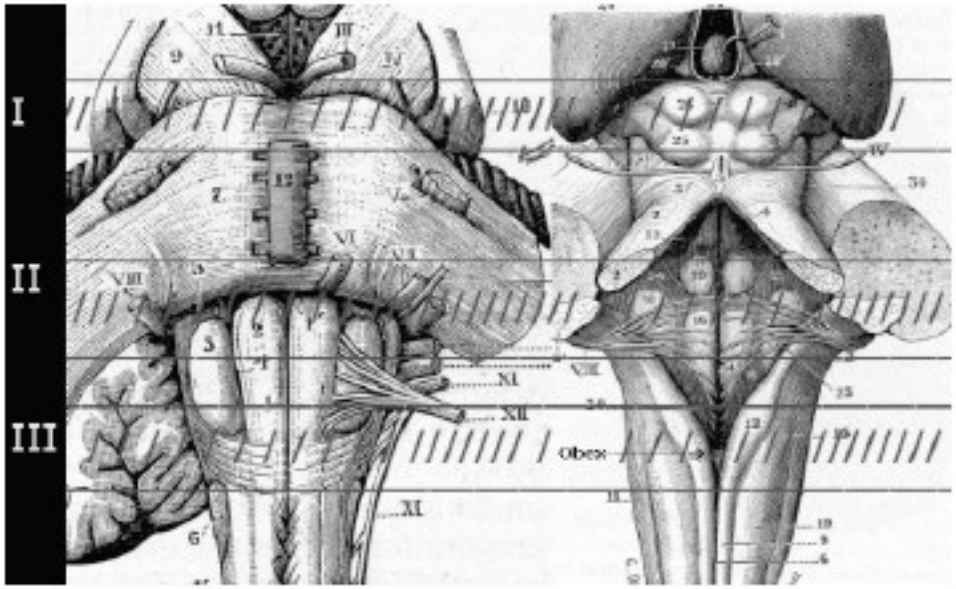
Adv Clin Path 1998; 2: 313-316



L. Matturri, G. Ottaviani, AM. Lavezzi

Unexpected sudden death related to encephalitis of the brainstem.

Acta Neuropathol 2005;105:554-555



Sampling of the brainstem, ventral (left) and dorsal (right) surface :

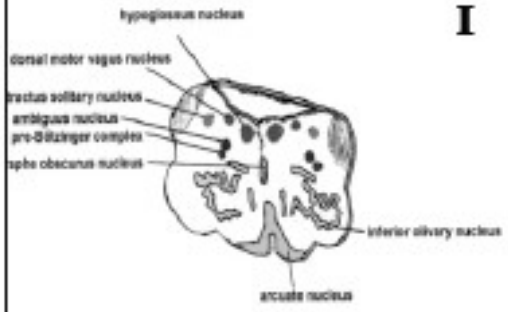
the main groups of neurons involved in the control of the vital functions (respiratory, cardiovascular, arousal, upper digestive) are located in these 3 different brainstem areas

- ***TECHNIQUES AND CRITERIA IN PATHOLOGIC AND FORENSIC-MEDICAL DIAGNOSTICS OF SUDDEN UNEXPECTED INFANT AND PERINATAL DEATH***

  Matturri L., Ottaviani G., Lavezzi A.M. ***Am J Clin Pathol 2005; 124: 259-268***

- ***GUIDELINES FOR NEUROPATHOLOGIC DIAGNOSTICS OF PERINATAL UNEXPECTED LOSS AND SUDDEN INFANT DEATH SYNDROME (SIDS) – A TECHNICAL PROTOCOL***

  Matturri L., Ottaviani G., Lavezzi A.M. **Virchows Arch 2008; 452: 19-25**



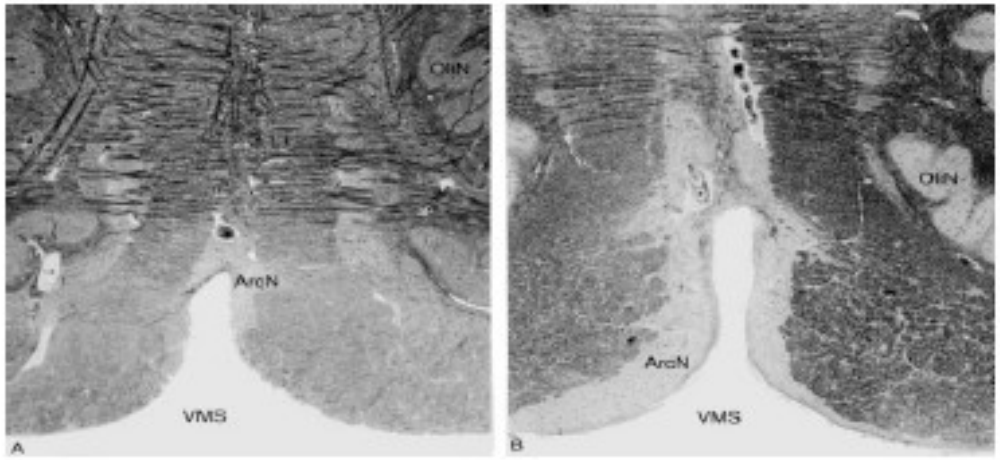
I

ARCUATE NUCLEUS HYPOPLASIA

Unexplained stillbirth.....56%

Unexpected early neonatal deaths.....50%

SIDS victims.....50%



- **Hypoplasia of Medullary Arcuate Nucleus in Unexpected Late Fetal Death (Stillborn Infants): A Pathologic Study**

L. Matturri, I. Minoli, AM. Lavezzi, A. Cappellini, S.G. Ramos, L. Rossi ***Pediatrics 2002; 109: E43***

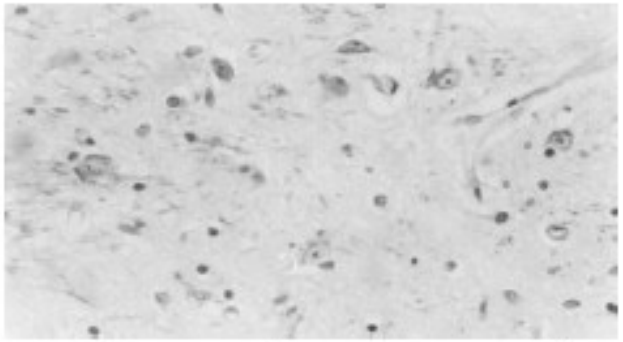
- **Severe Hypoplasia of Medullary Arcuate Nucleus: Quantitative Analysis in Sudden Infant Death Syndrome**

L. Matturri, B. Biondo, P. Mercurio, L. Rossi ***Acta Neuropathol 2000; 99: 371-375***

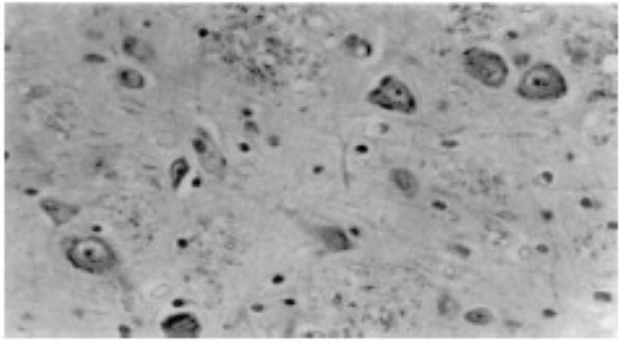
Hypoplasia of the parabrachial Kölliker-Fuse complex was detected in unexplained intrapartum stillbirth and early neonatal deaths

"Preliminary Study on the Cytoarchitecture of the Human Parabrachial / Kölliker-Fuse Complex, with Reference to Sudden Infant Death Syndrome and Sudden Intrauterine Unexplained Death"

AM. Lavezzi, G. Ottaviani, G. Ballabio, L. Rossi, L. Matturri *Pediatr Dev Pathol 2004; 7: 171-179*



KF in a neonate born at 41+1 weeks with severe asphixia. Sudden death 20h after delivery.
Klüver-Barrera, 50x

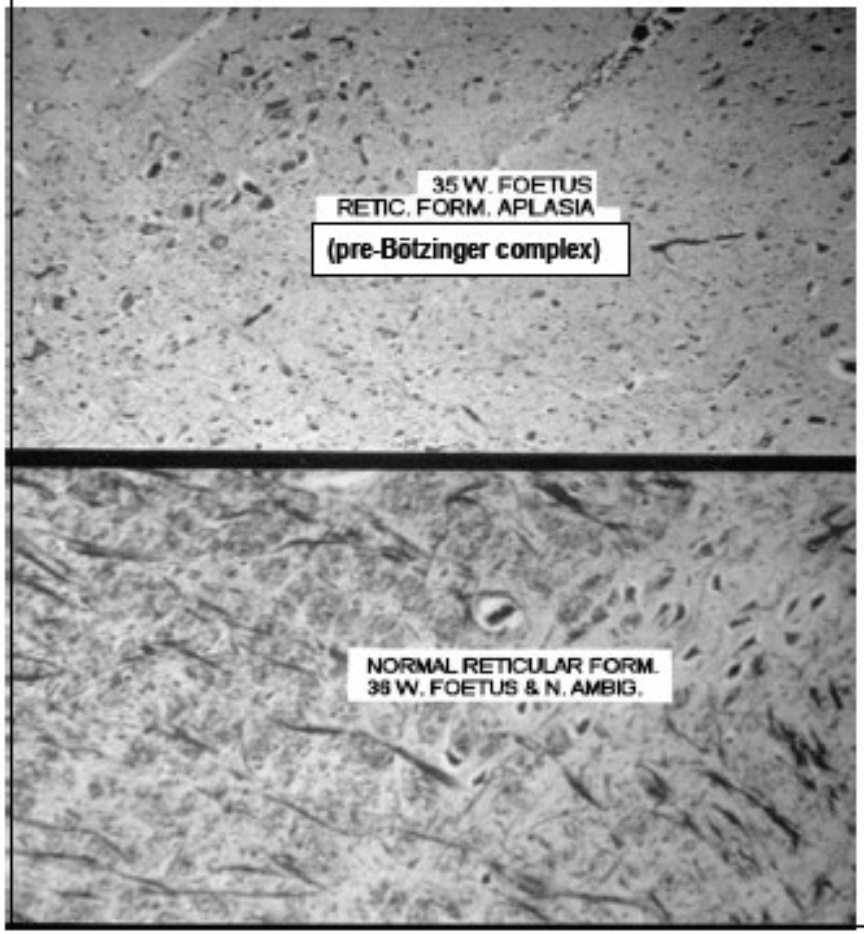


KF in a control case
Klüver-Barrera, 50x

Functional neuroanatomy of the human pre-Bötzinger complex with particular reference to sudden unexplained perinatal and infant death

AM Lavezzi and L Matturri

Neuropathology 2008; 28(1):10-6

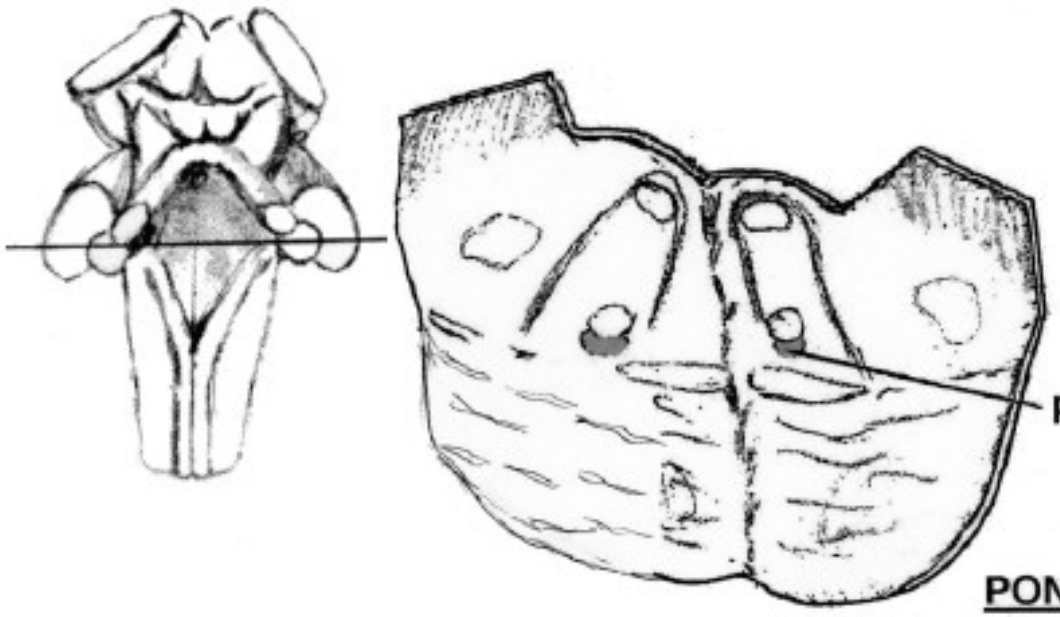


The authors are the first to identify in man the pre-Bötzinger complex, a structure of the brainstem critical for respiratory rhythmogenesis, previously investigated only in rats.

The authors suggest that the pre-Bötzinger complex contains a variety of neurons not only involved in respiratory rhythm generation, but more extensively, essential to the control of all vital functions. Sudden unexpected fetal death could be ascribed ro a selective process when developmental alterations of the pre-Bötzinger complex arise.

Hypoplasia/agenesis of the pBc was observed in 25% of the perinatal loss.

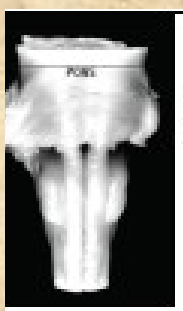
The parafacial complex is the trigger and the master generator of the vital functions of the pre-Bötzinger complex in mammals.

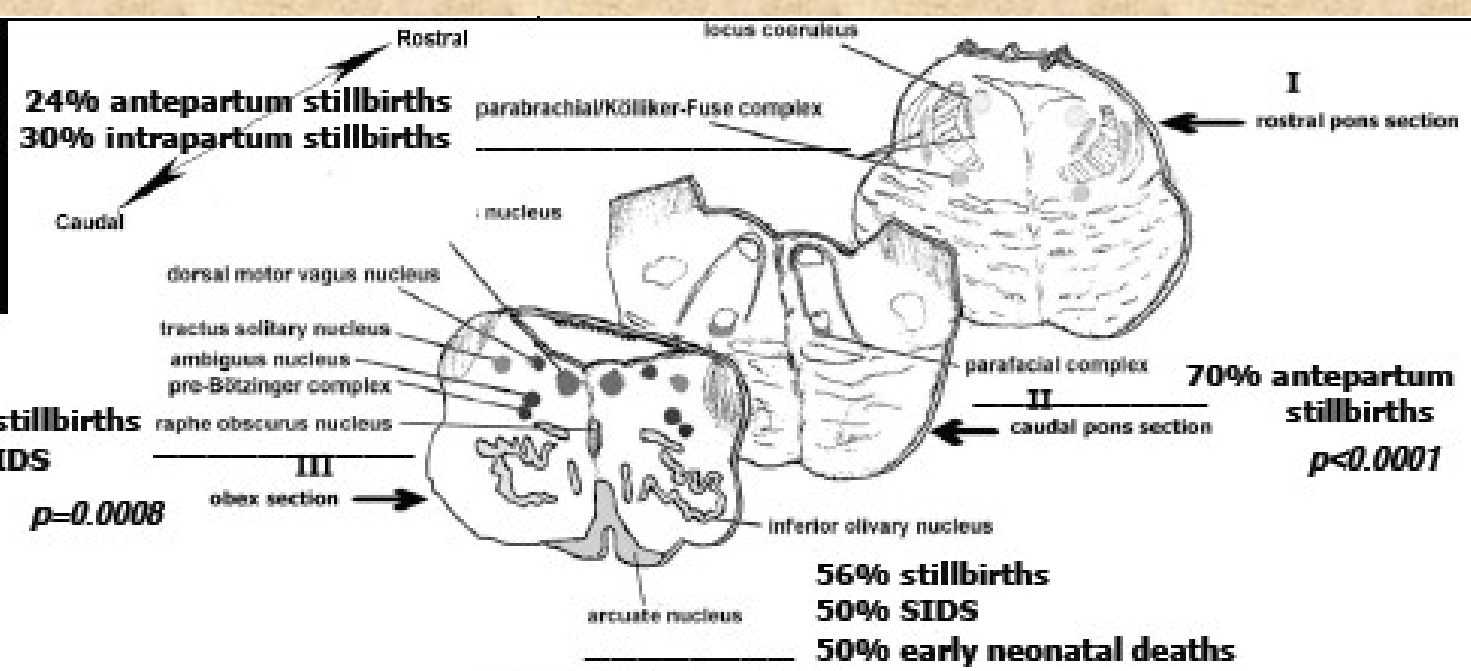


HYPOPLASIA OF THE PARAFACIAL-FACIAL COMPLEX: A VERY FREQUENT FINDING IN SUDDEN UNEXPLAINED FETAL DEATH

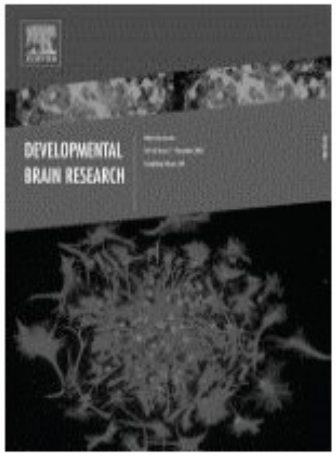
Lavezzi A.M., Matturri L.

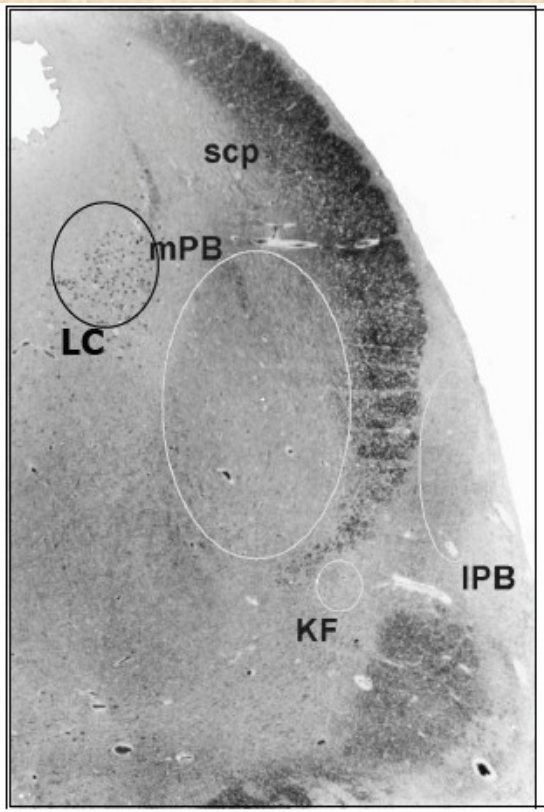
Journal of the Neurological Sciences 2006, 59:497-500

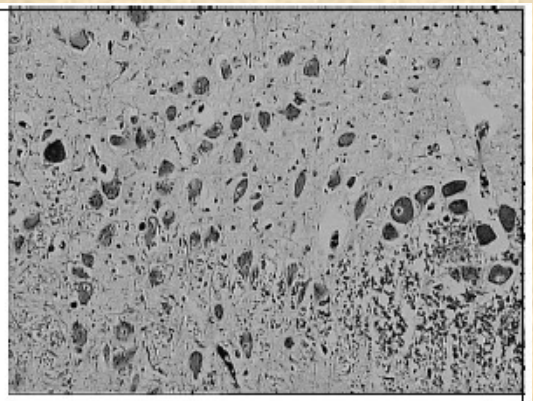


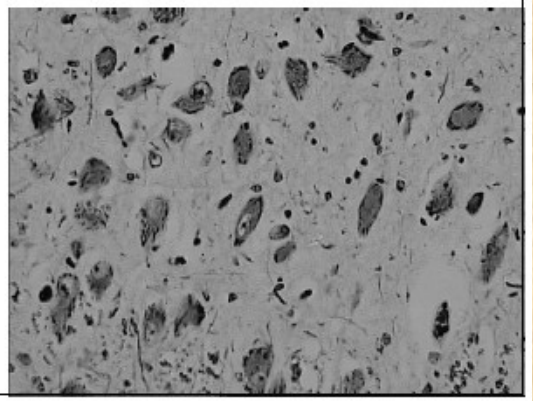


Frequent associations:









AM. Lavezzi, G. Ottaviani, R. Mingrone, L. Matturri

Analysis of the Human Locus Coeruleus in Perinatal and Infant Sudden Unexplained Death. Possible role of the cigarette smoking in the development of this nucleus

Dev Brain Res 2005; 154: 71-80

Punti chiave

Sistema Nervoso Autonomo Periferico

CENTRO DI RICERCA
LINO ROSSI
Università di Milano

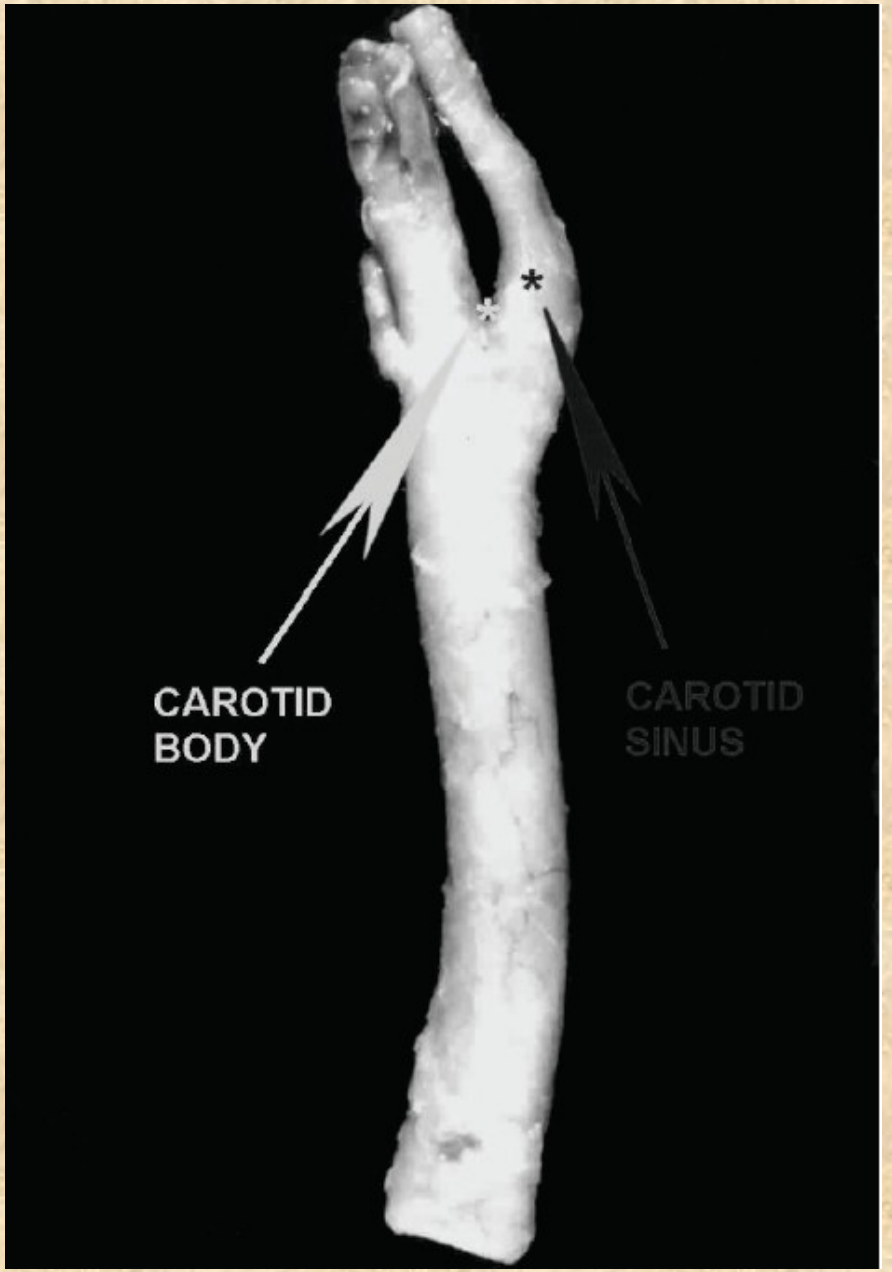
Protocollo per l'esame del Sistema Nervoso Autonomo Periferico

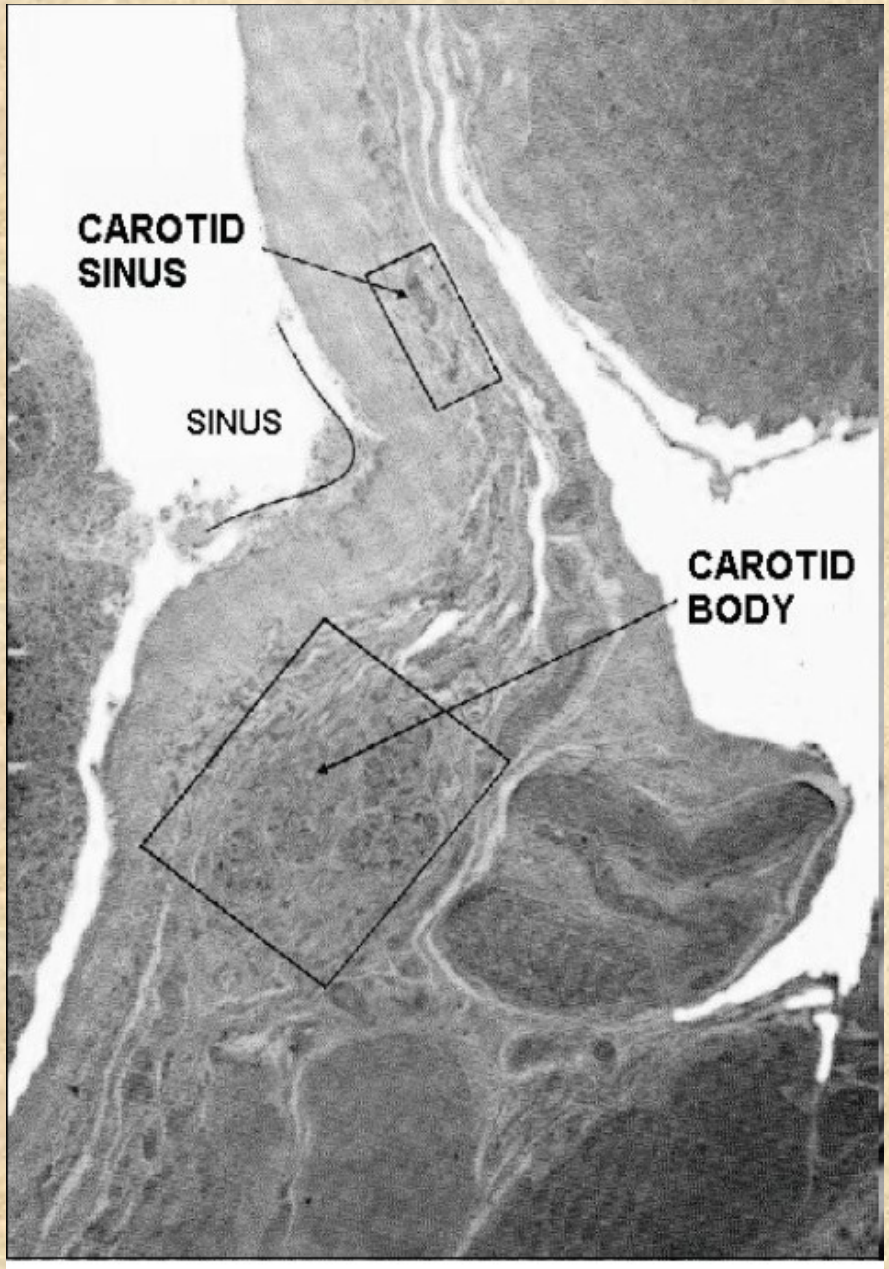
Prelievo delle seguenti strutture:

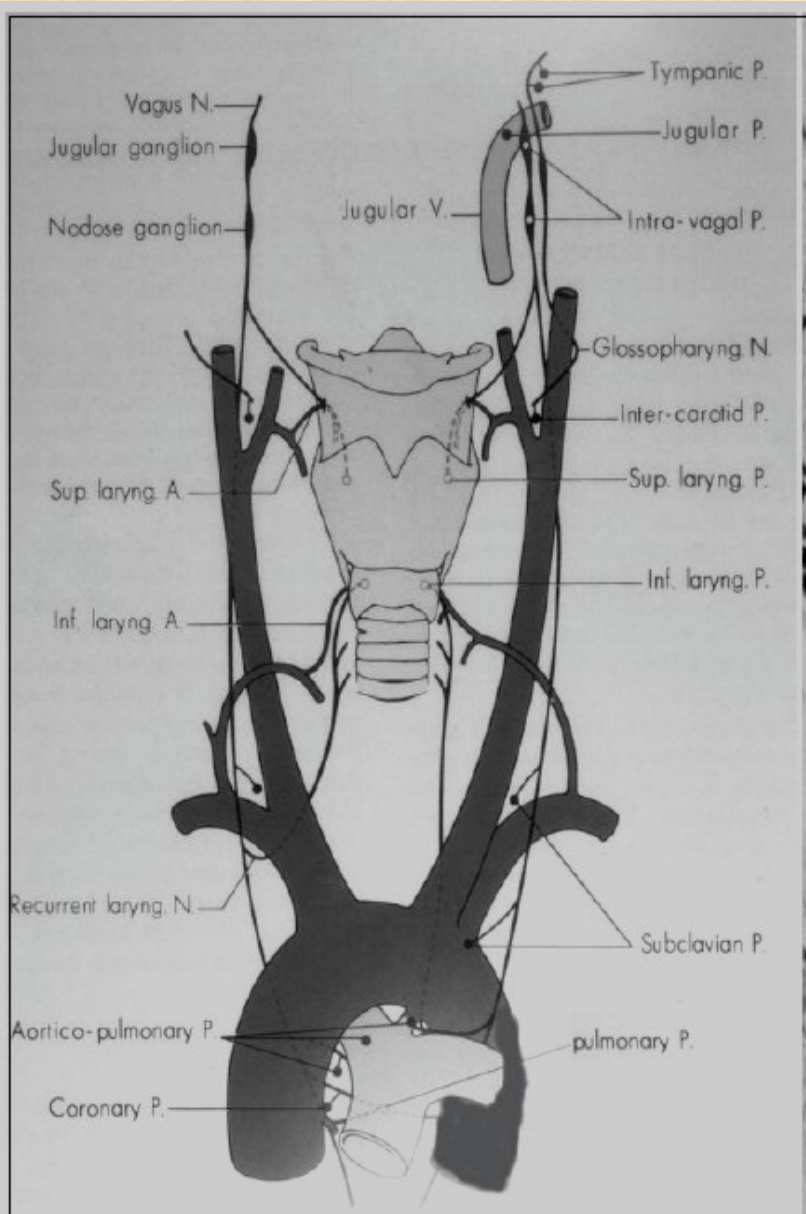
A) Gangli simpatici (gangli stellato e cervicale superiore)

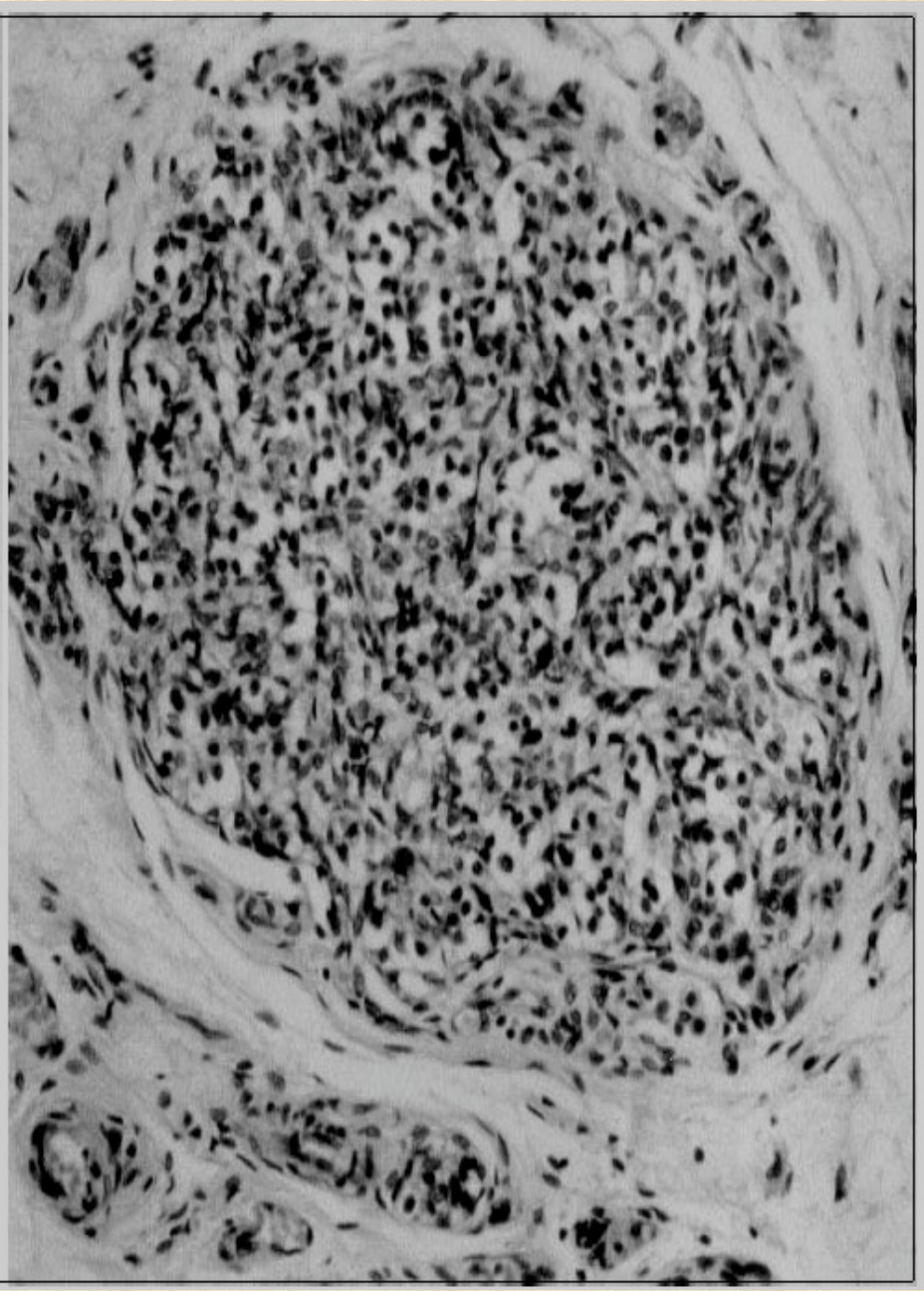
B) Biforcazione carotidea

C) Plessi gangliari e paragangliari mediastinici


CAROTID
BODY
CAROTID
SINUS


CAROTID
SINUS
SINUS
CAROTID
BODY


Tympanic P.
Vagus N.
Jugular P.
Jugular ganglion
Jugular V.
Intra-vagal P.
Nodose ganglion
Glossopharyng. N.
Inter-carotid P.
Sup. laryng. A.
Sup. laryng. P.
Inf. laryng. P.
Inf. laryng. A.
Recurrent laryng. N.
Subclavian P.
Aortico-pulmonary P.
pulmonary P.
Coronary P.



Punti chiave

Cuore

PATHOLOGICA 2010;102:398-404

LINEE GUIDA

Linee Guida per lo studio autoptico della morte improvvisa cardiaca

C. BASSO[1], M. BURKE[2], P. FORNES[3], P.J. GALLAGHER[4], R.H. DE GOUVEIA[5], M. SHEPPARD[6], G. THIENE[1], A. VAN DER WAL[7]

A nome della *Association for European Cardiovascular Pathology*
http://anpat.unipd.it/aecvp/

[1] Dipartimento di Scienze Medico Diagnostiche e Terapie Speciali, Università di Padova, Italia; [2] Dipartimento di Istopatologia, Royal Brompton & Harefield NHS Trust, Harefield Hospital, UK; [3] Dipartimento di Patologia, Hopital Européen G. Pompidou, Parigi, Francia; [4] Dipartimento di Patologia, Southampton University Hospitals, UK; [5] Dipartimento di Patologia, Hospital de Santa Cruz, Lisbona, Portogallo; [6] Dipartimento di Patologia, Royal Brompton Hospital, Londra, UK; [7] Dipartimento di Patologia, Academic Medical Center, Università di Amsterdam, Olanda

Parole chiave

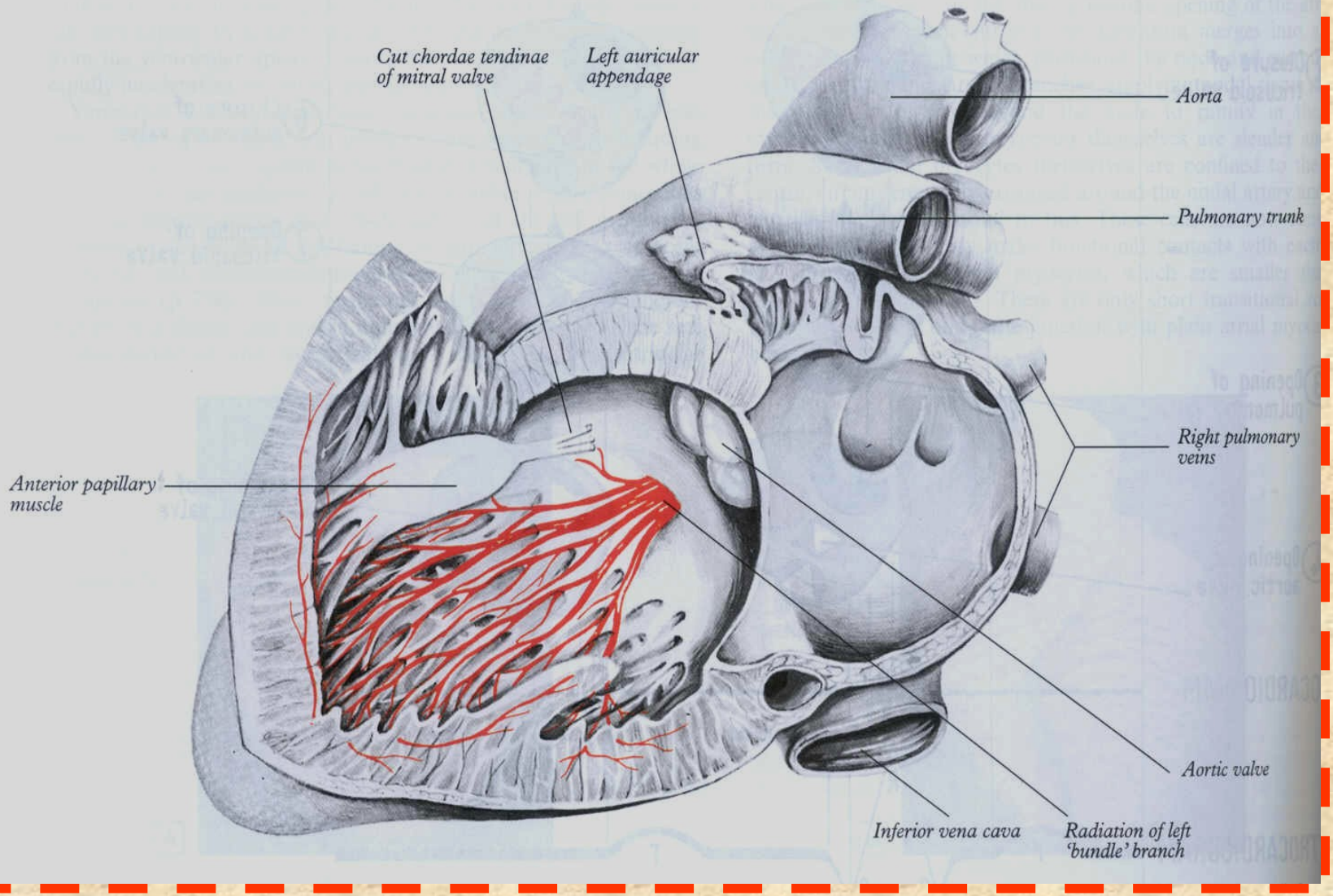
Autopsia • Linee Guida • Protocollo • Morte improvvisa cardiaca

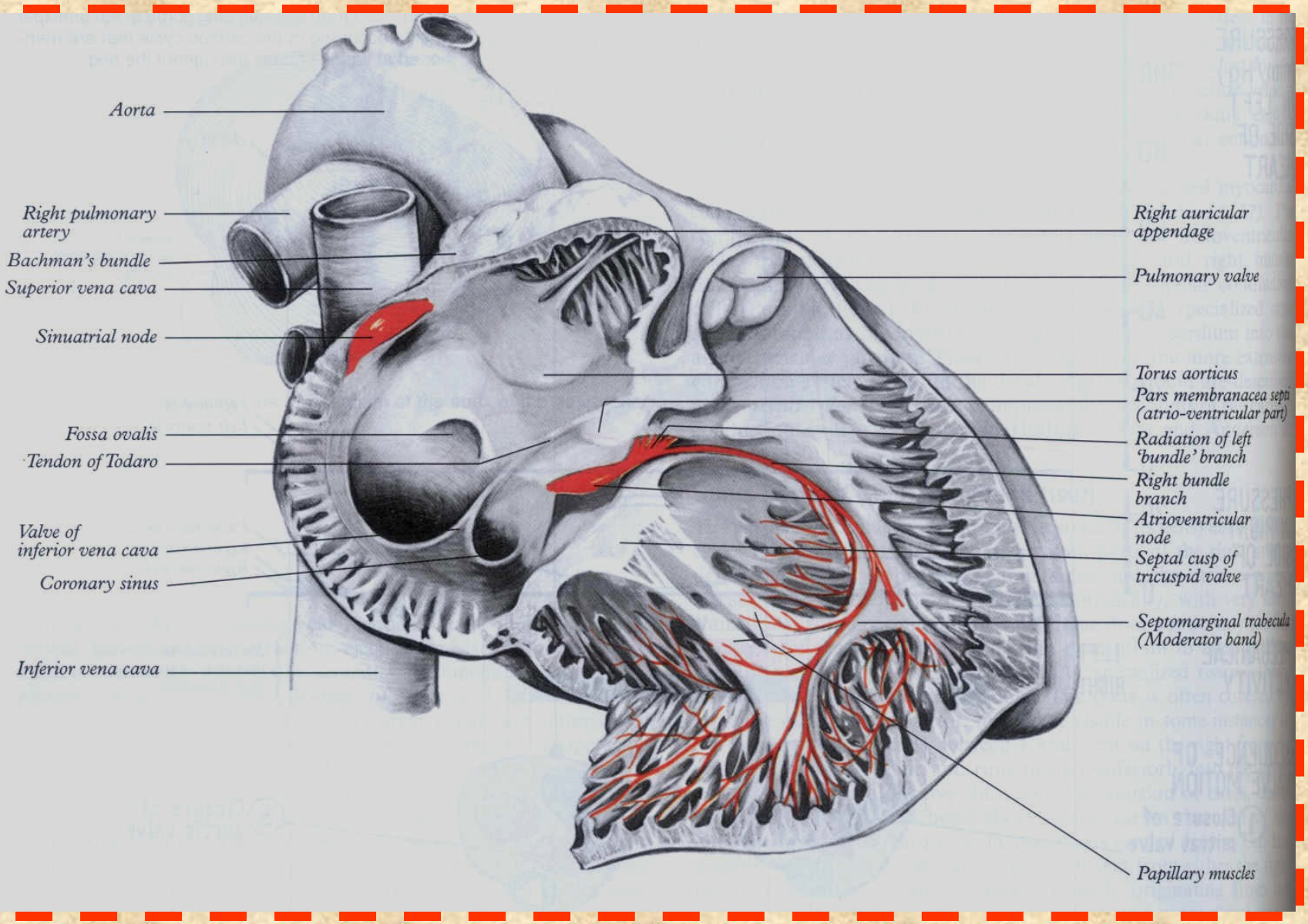
Tab. I. Cause di MI allo studio postmortem.

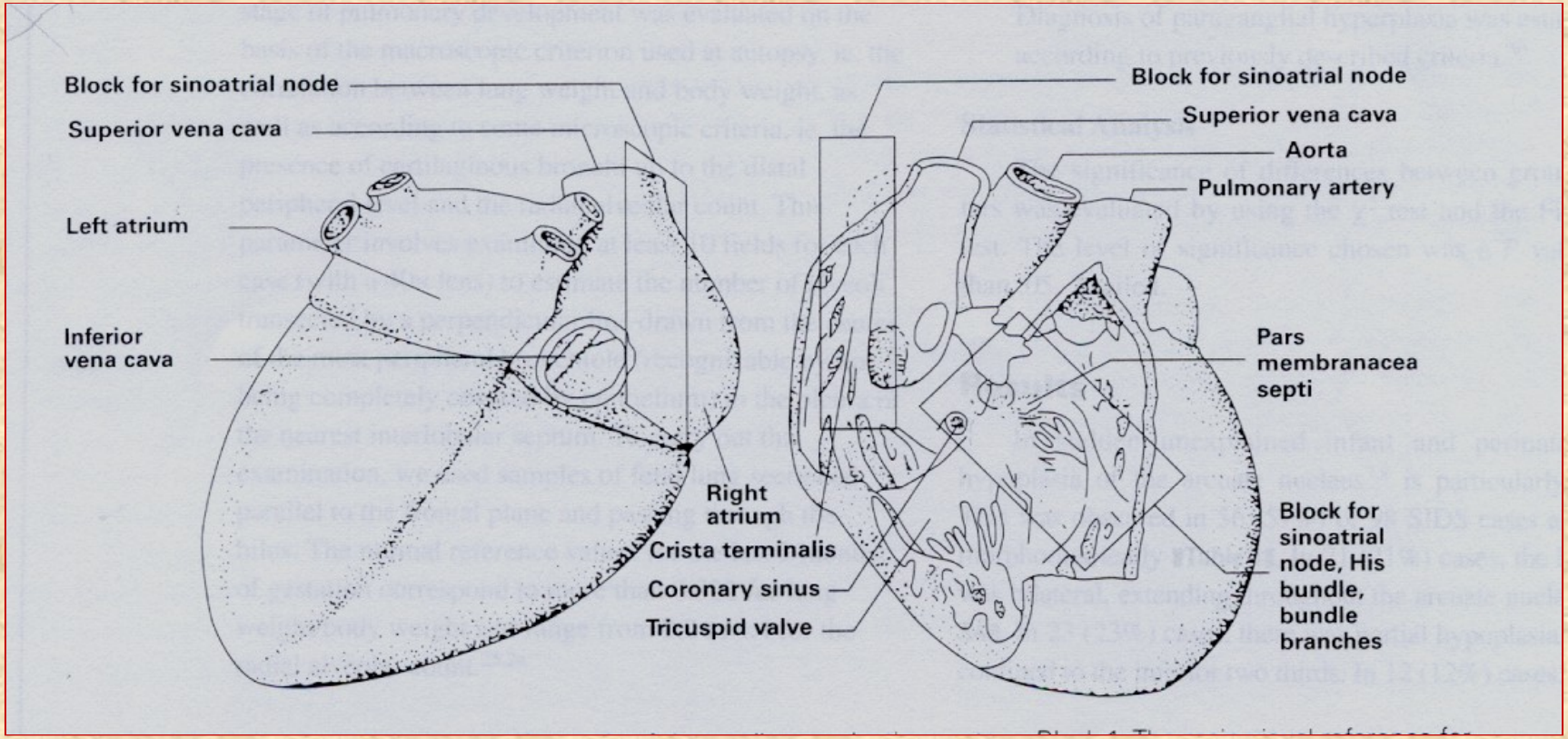
Meccanica
- Emopericardio e tamponamento cardiaco
  - Rottura dell'aorta ascendente (ipertensione, Marfan, valvola aortica bicuspide, coartazione, altre)
  - Rottura di cuore post infartuale nella parete libera
- Embolia polmonare
- Insufficienza acuta della valvola mitrale con edema polmonare
  - Rottura dei muscoli papillari post infartuale
  - Rottura corde tendinee (prolasso mitrale)
- Ostruzione intracavitaria (i.e. trombo/neoplasia)
- Improvvisa disfunzione della protesi valvolare (i.e. lacerazione, deiscenza, blocco trombotico)
- Assenza congenita parziale del pericardio

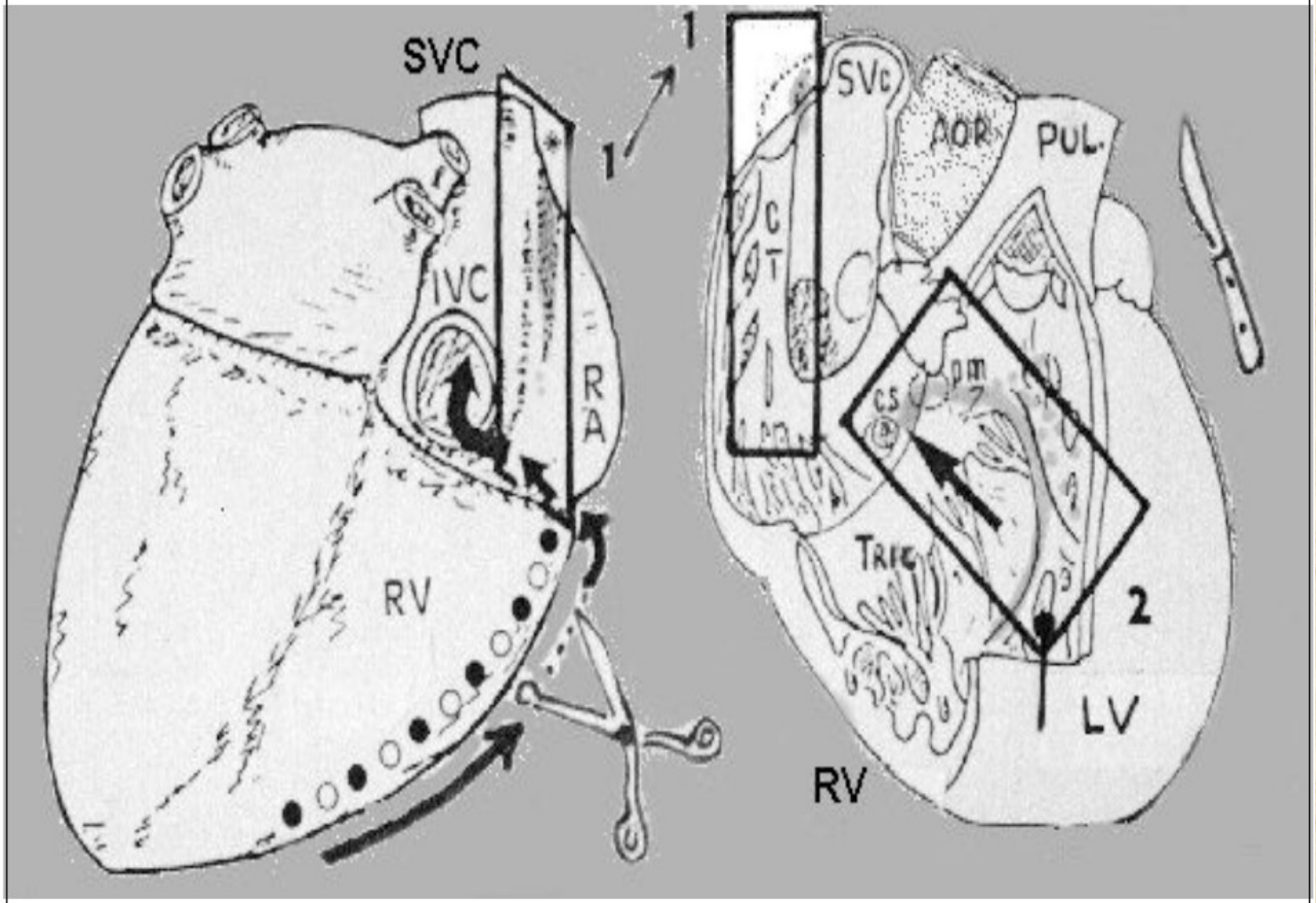
Elettrica
- Arterie coronarie (+/- cicatrice post infartuale)
  - Anomalie congenite
    - Origine dall'Aorta
      - Seno sbagliato (arteria coronaria destra dal seno sinistro, arteria coronaria sinistra dal seno destro)
      - Ramo circonflesso sinistro dal seno destro o dall'arteria coronaria destra
      - Origine alta dalla porzione tubulare
      - Plicatura ostiale
    - Origine dell'arteria Polmonare
      - Decorso intramiocardico ("ponte miocardico")
  - Acquisite
    - Aterosclerosi
      - Complicata (trombo, emorragia)
      - Non complicata
    - Embolia
    - Arterite
    - Dissezione
  - Altro
    - Displasia fibromuscolare
    - Malattia intramurale dei piccoli vasi
    - Rigetto trapianto cardiaco, acuto o cronico
  - Precendenti interventi chirurgici o procedure interventistiche
    - By-pass coronarico (vena safena, arteria mammaria, arteria radiale, ecc.)
    - Angioplastica coronarica con palloncino, stents
- Miocardio
  - Cardiomiopatia ipertrofica
  - Cardiomiopatia aritmogena del ventricolo destro
  - Cardiomiopatia dilatativa
  - Cardiomiopatia infiammatoria (miocardite)
  - Cardiomiopatie secondarie (accumulo, infiltrative, sarcoidosi ecc.)
  - Cardiopatia ipertensiva
  - Ipertrofia idiopatica del ventricolo sinistro
  - Cardiomiopatie non classificate (spongy myocardium, fibroelastosi)
- Valvole
  - Stenosi aortica
  - Degenerazione mixoide con prolasso della valvola mitrale
- Tessuto di conduzione
  - Blocco seno-atriale
  - Blocco atrio-ventricolare (malattia di Lev-Lenegre, tumore cistico del nodo AV)
  - Preeccitazione ventricolare (sindrome di Wolff-Parkinson-White, sindrome di Lown-Ganong-Levine)
- Cardiopatia congenita (operata e non), con e senza sindrome di Eisenmenger
- Cuore normale (MI "sine materia" o inspiegata o sindrome della MI aritmica)
  - Sindrome del QT lungo e corto
  - Sindrome di Brugada
  - Tachicardia ventricolare polimorfa catecolaminergica
  - Fibrillazione ventricolare idiopatica

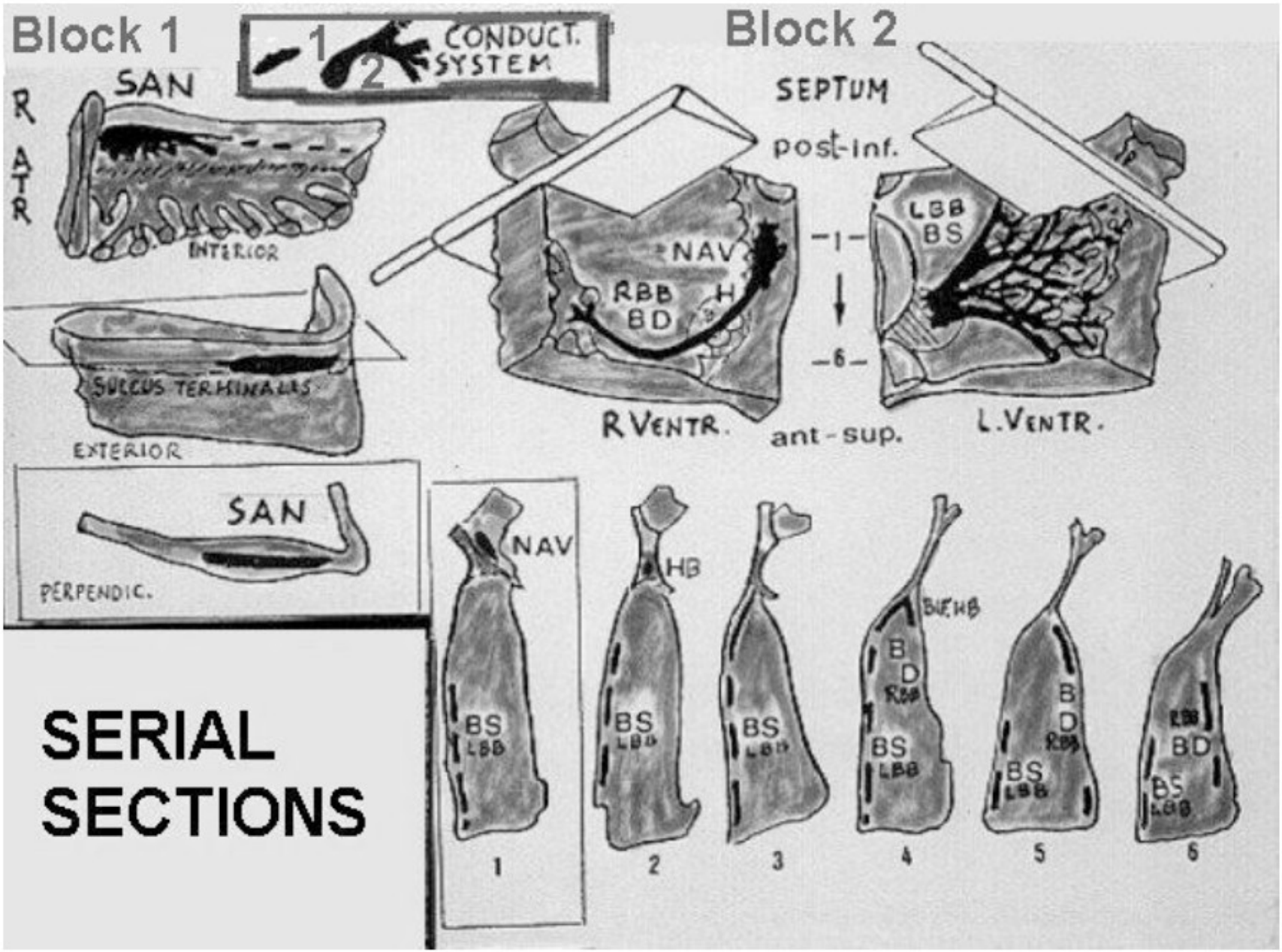
MI: morte improvvisa

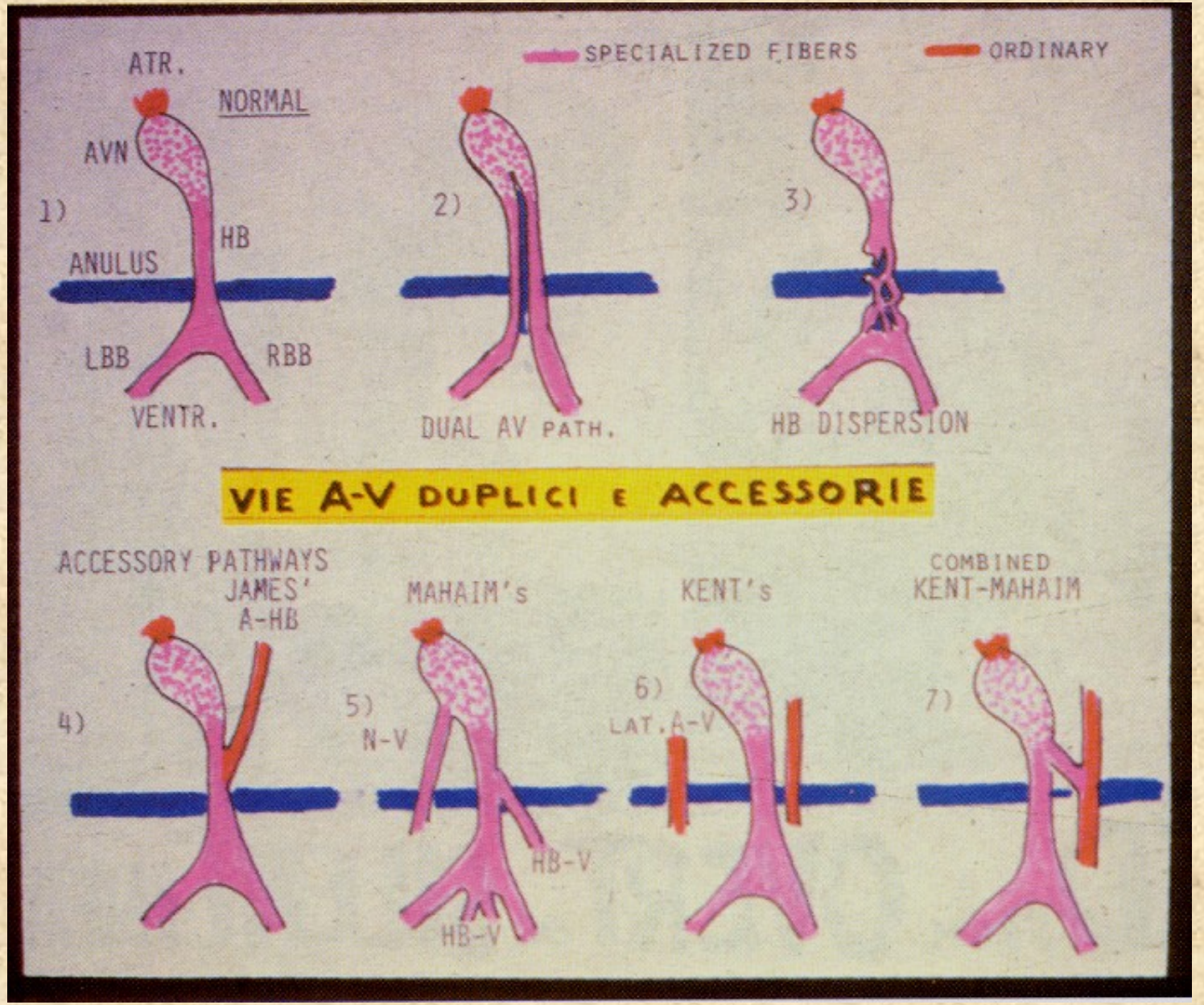

Cut chordae tendinae of mitral valve
Left auricular appendage
Aorta
Pulmonary trunk
Right pulmonary veins
Anterior papillary muscle
Aortic valve
Inferior vena cava
Radiation of left 'bundle' branch

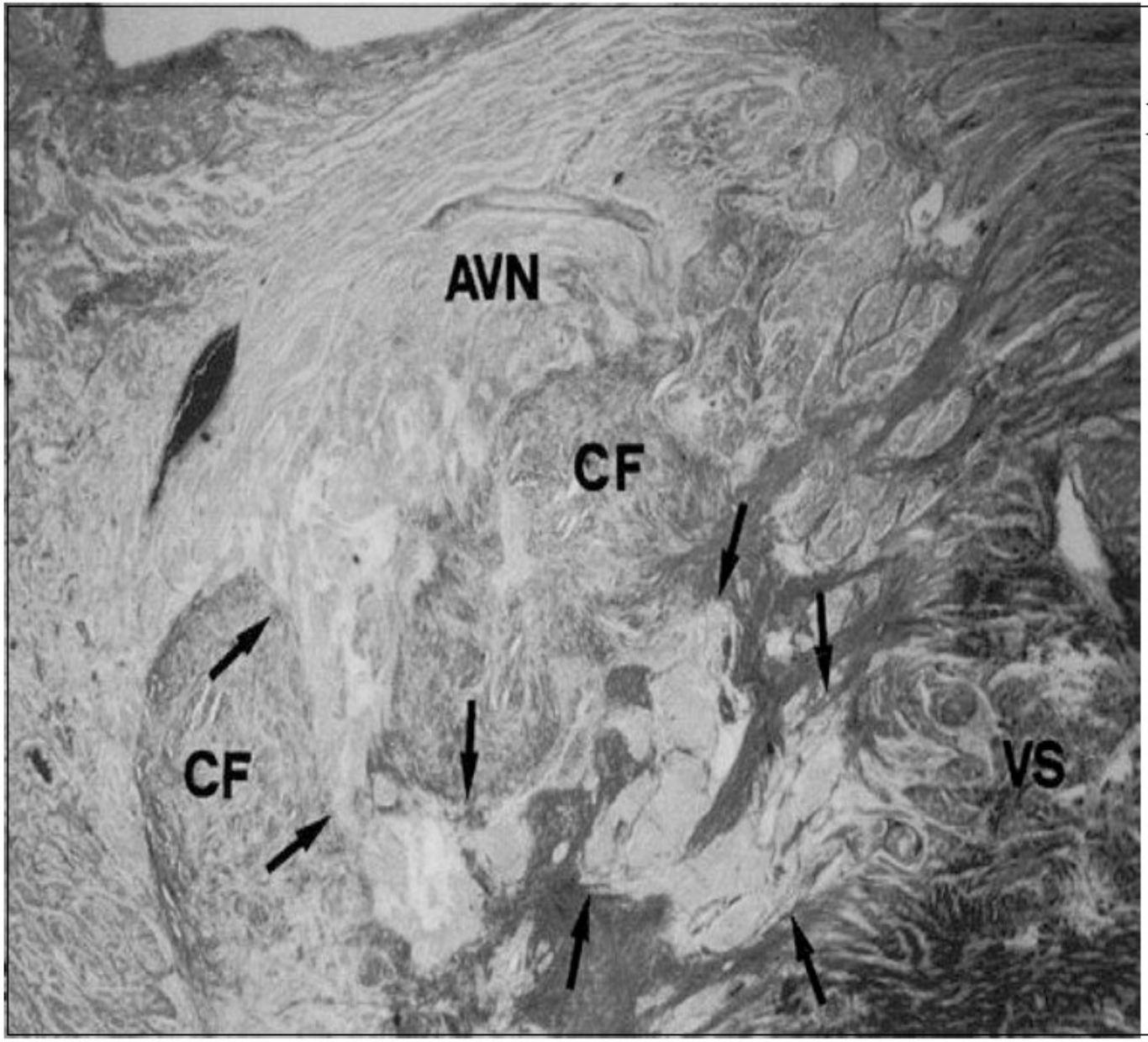

Aorta
Right pulmonary artery
Bachman's bundle
Superior vena cava
Sinuatrial node
Fossa ovalis
Tendon of Todaro
Valve of inferior vena cava
Coronary sinus
Inferior vena cava
Right auricular appendage
Pulmonary valve
Torus aorticus
Pars membranacea septi (atrio-ventricular part)
Radiation of left 'bundle' branch
Right bundle branch
Atrioventricular node
Septal cusp of tricuspid valve
Septomarginal trabecula (Moderator band)
Papillary muscles


Block for sinoatrial node
Superior vena cava
Left atrium
Inferior vena cava
Right atrium
Crista terminalis
Coronary sinus
Tricuspid valve
Block for sinoatrial node
Superior vena cava
Aorta
Pulmonary artery
Pars membranacea septi
Block for sinoatrial node, His bundle, bundle branches

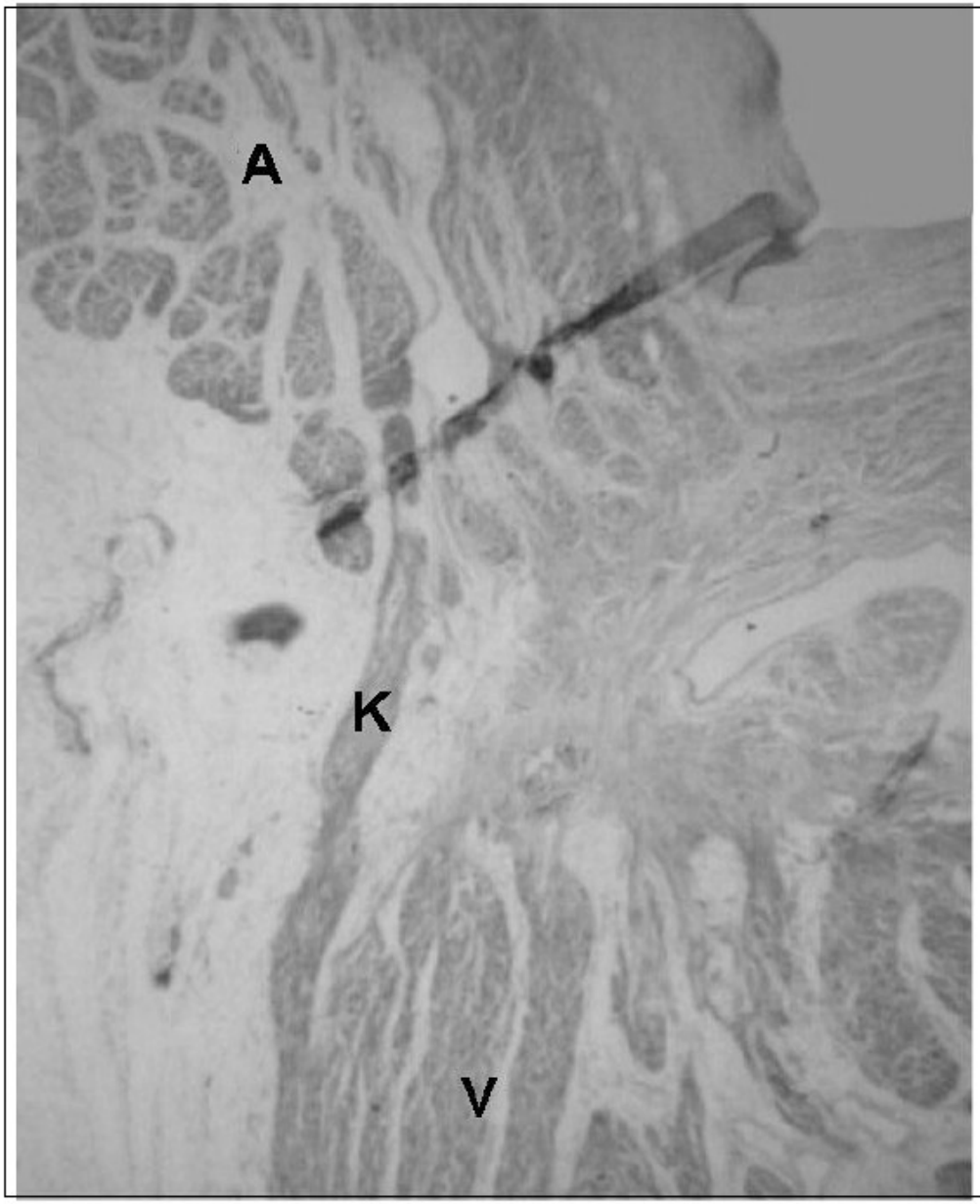

SVC
IVC
RA
RV
1
1
SVC
AOR
PUL.
CT
CS
TRIC
2
LV
RV


Block 1
1
2
CONDUCT. SYSTEM
Block 2
SAN
R
A
T
R
INTERIOR
SEPTUM
post-inf.
NAV
RBB
BD
H
LBB
BS
-1-
-6-
SULCUS TERMINALIS
EXTERIOR
R VENTR.
ant-sup.
L. VENTR.
SAN
PERPENDIC.
NAV
HB
BS
LBB
BIF HB
B
D
RBB
1
2
3
4
5
6
SERIAL
SECTIONS

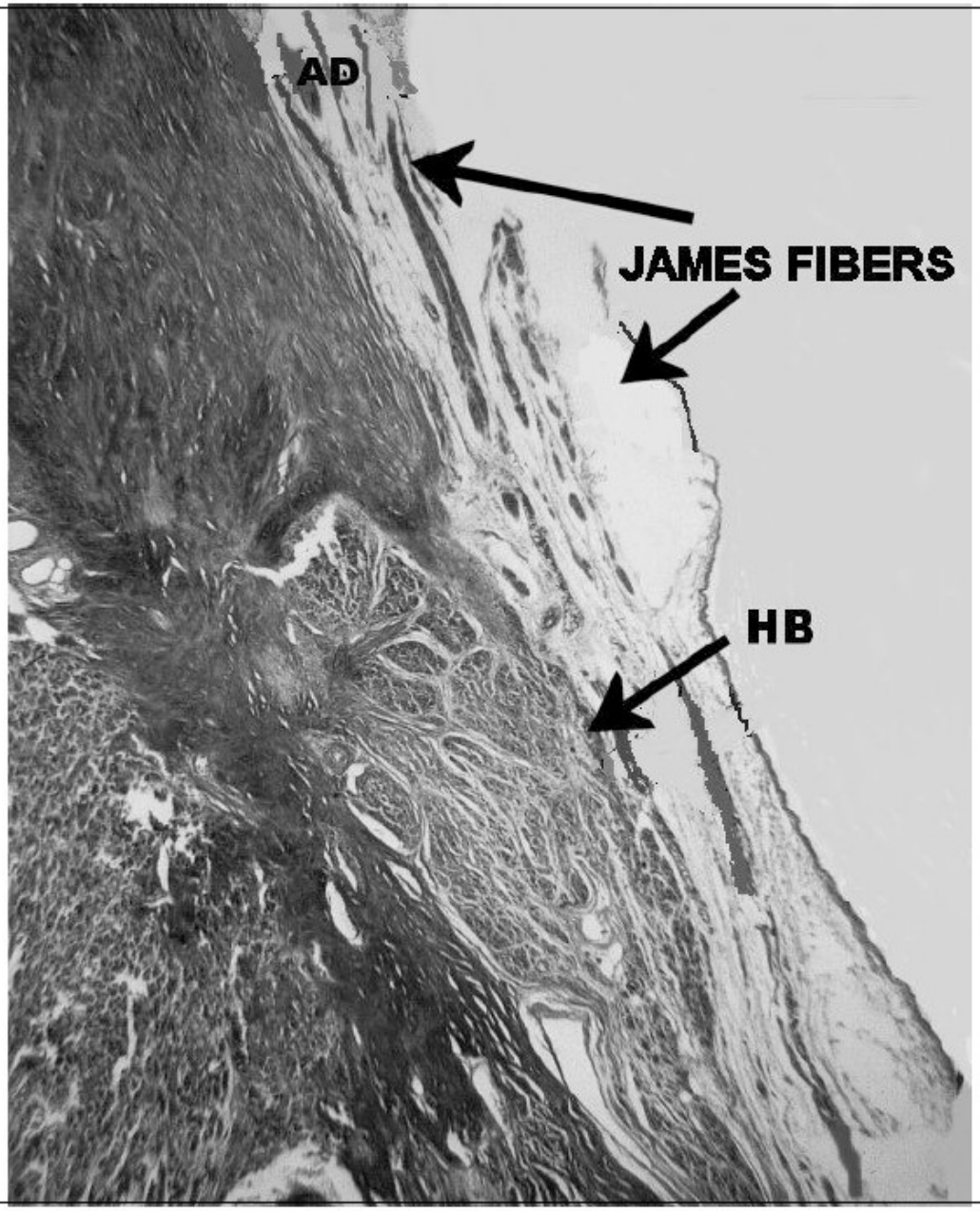

SPECIALIZED FIBERS
ORDINARY
ATR.
NORMAL
AVN
1)
HB
ANULUS
LBB
RBB
VENTR.
2)
DUAL AV PATH.
3)
HB DISPERSION
VIE A-V DUPLICI E ACCESSORIE
ACCESSORY PATHWAYS
JAMES'
A-HB
4)
MAHAIM's
5)
N-V
HB-V
HB-V
KENT's
6)
LAT. A-V
COMBINED
KENT-MAHAIM
7)



MAHAIM FIBERS

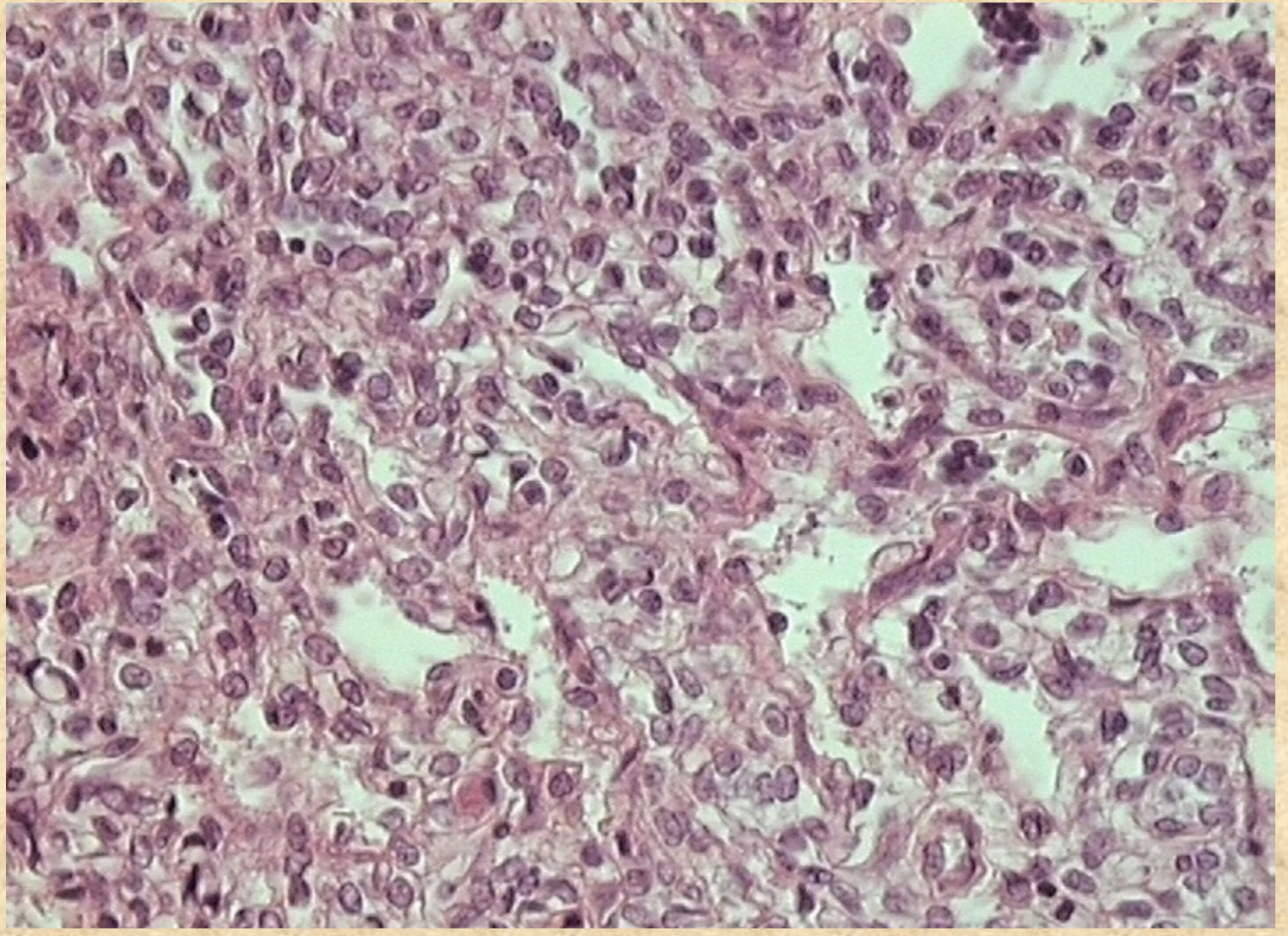


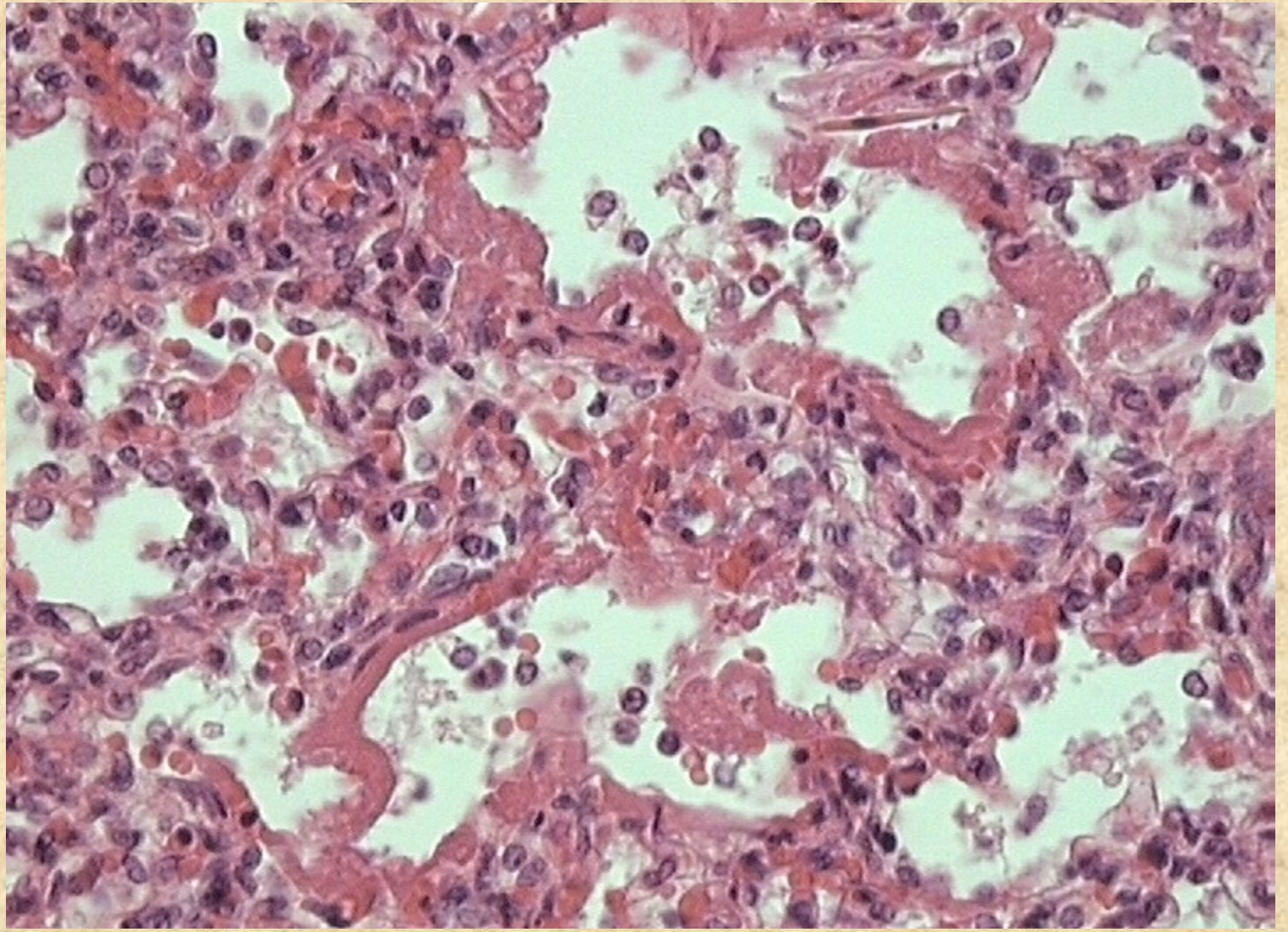
KENT FIBERS


AD
JAMES FIBERS
HB

Punti chiave

Polmone





Chair: **T.O. Rognum** (Norway), **P.J. Berry** (UK)

14.15 Update on revision of 25 years of diagnosis of sudden infant death in the Nordic countries
Vege A., Isaksen C.V., Jorgensen L., Loberg E.M., Morild I., Stoltenberg L., Rognum T.O., Hirvonen J., Rammer L., Rajs J., Löwenhielm P., Bercowics A., Gregersen M., Koch K., Helweg-Larsen K. (Oslo, Norway)

14.30 SID: A syndrome possible linked with prenatal developmental disorder of the brain?
Bise K., Pankratz H., Eisenmenger W. (Munich, Germany)

14.40 Brain stem gliosis is caused by intrauterine hypoxia
Stoltenburg G., Kordes U., Türker T. (Berlin, Germany)

14.55 Vitreous humour hypoxanthine levels in SIDS and other causes of death in infancy
Rognum T.O., Vege A., Opdal S.H., Saugstad O.D. (Oslo, Norway)

15.10 Immaturity or toxic burden? Postmortem study of inspiratory muscles in sudden infant death
Wetzel S., Keim C., Stoltenburg G., Rothschild M., Drasch G. (Berlin, Germany)

15.20 Differences in the frequency of balt in the lungs of children with SIDS and children who died of natural death or lethal trauma indicate environmental stimuli
Kleemann W.J., Tschernig T., Pabst R. (Hannover, Germany)

15.30 Alteration of pulmonary artery wall in SIDS
Fulcheri E., Dagnino F., Pantarotto M.F., Badini A. (Genova, Italy)

15.40 Differentiation of the SIDS-collective by means of immunological serum-essays and immunohistology
Amberg R., Pollak S. (Freiburg, Germany)

15.55 **COFFEE BREAK**

ESPID

EUROPEAN SOCIETY FOR THE STUDY AND PREVENTION OF INFANT DEATH

SIDS AUSTRIA

SIDS EUROPE

International Congress on SUDDEN INFANT DEATH SYNDROME

Graz – Austria May 24 to 27, 1995

"The Role of Environmental Factors in Infant Morbidity and Mortality"

Final Program

Department of Physiology and Department of Paediatrics
Karl-Franzens-University Graz, Austria
Ministry of Health, Austria