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HOW NOT TO MISS A HEMATOLOGICAL MALIGNANCY

SPEAKER
Dr Anamika Bakliwal

CHAIRPERSONS
Dr Anupam Sachdev, Dr Sanjeev Sharma, Dr Tulika Seth, Dr Nomeeta Gupta

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Dr Anamika Bakliwal

DESIGNATION	Consultant -Department of clinical hematology & BMT
CURRENT AFFILIATION	BLK-Max Hospital, Pusa Road
ACHIEVEMENTS	MBBS-SMS medical college MD Pediatrics -BJ medical college DM Clinical Hematology AIIMS Over 9.5 years of expierence in the field of hematology & BMT. Authored chapters in hematology textbooks & MCQ books . Over 50 publications in International and national journals

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NAME	DR SANJEEV KUMAR SHARMA
DESIGNATION	DIRECTOR – BMT INCHARGE- ACADEMICS AND RESEARCH
CURRENT AFFILIATION	BLK-MAX SUPERSPECIALITY HOSPITAL
ACHIEVEMENTS	MORE THAN 80 PUBLICATIONS IN NATIONAL AND INTERNATIONAL JOURNALS. AUTHOR OF BOOKS – MCQS IN HEMATOLOGY, BASICS OF HEMATOPOIETIC STEM CELL TRANSPLANT, AND MY 32 DAYS IN BMT WARD

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Dr Tulika Seth

DESIGNATION	Professor Hematology
CURRENT AFFILIATION	AIIMS, New Delhi
ACHIEVEMENTS	Guide and co-guide for >30 DM, PhD students Authored >290 papers >60 book chapters Chairperson for Disability guidelines for blood disorders Government of India national guidelines for thalassemia, and sickle cell anemia 2016 and TOT guidelines sickle cell 2022

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HOW NOT TO MISS A CANCER IN A CHILD

Dr ANAMIKA BAKLIWAL
MD, DM CLINICAL HEMATOLOGY (AIIMS)

CONSULTANT CENTRE FOR BONE MARROW TRANSPLANTATION

BLK-MAX SUPER SPECIALITY HOSPITAL, NEW DELHI

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AGENDA POINTS

1. BURDEN OF DISEASE
2. REASON FOR DELAYS
3. CASE SCENARIOS
4. TAKE HOME MESSAGE

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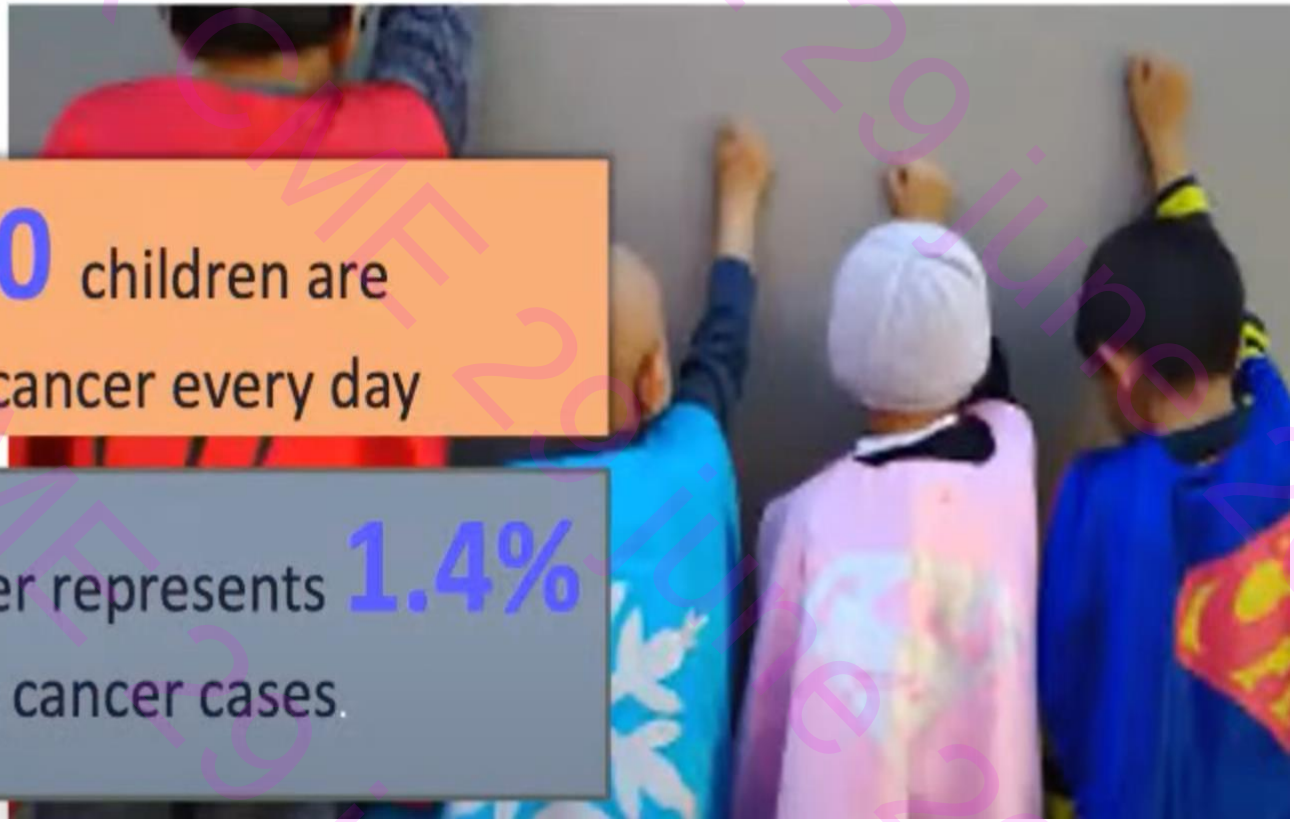
Burden - Childhood cancer



Globally, **1000** children are diagnosed with cancer every day

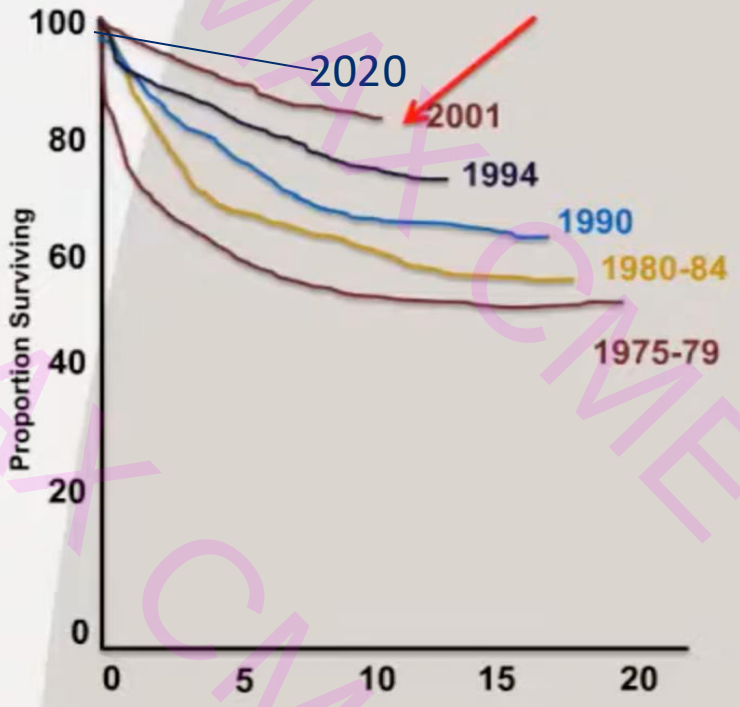
Childhood cancer represents **1.4%** of new cancer cases.

BURDEN -CHILDHOOD CANCER –WORLD & INDIA

- THE MOST COMMON TYPES OF CHILDHOOD CANCERs INCLUDE **LEUKEMIAS**, **BRAIN TUMOURS**, **LYMPHOMAS** & OTHER SOLID TUMOURS SUCH AS NEUROBLASTOMA

- **ONE MILLION NEW CANCERS ARE DIAGNOSED ANNUALLY IN INDIA, AND 3% OF THESE OCCUR IN CHILDREN.** THESE 50,000 NEW PEDIATRIC CANCERS ANNUALLY DIAGNOSED IN INDIA COMPRISE ABOUT 20% OF ALL PEDIATRIC CANCERS IN THE WORLD.

Cancer Survival, 0–14 Years of Age



Survivorship

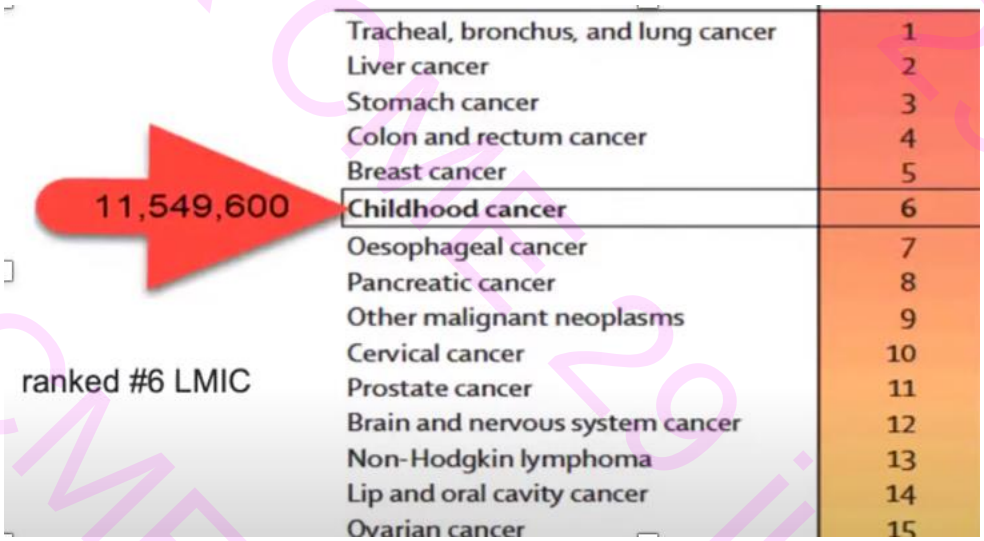
Estimated 379,000 childhood cancer survivors in the U.S.

1 in 680 is a childhood cancer survivor (ages 20 to 50 years)

http://seer.cancer.gov/csr/1978-2018 /,based on november 2020 SEER data submission ,posted to the SEER website ,April 2021.

RANKING OF INDIVIDUAL CANCERS

GBD 2017 LANCET ONCO



TYPES OF PEDIATRIC CANCERS WHICH CAN BE MISSED OR OVER LOOKED

HEMATOLOGICAL

LEUKEMIA (ALL & AML)
LYMPHOMA (HL AND NHL)

SOLID TUMORS-

- WILMS TUMOR
- NEUROBLSTOMA
- RHABDOMYOSARCOMA
- RETINOBLASTOMA
- HEPATOBLASTOMA

BONE – OSETOSARCOMA & EWING'S SARCOMA

CNS-BRAIN TUMORS

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REASONS FOR DIAGNOSTIC DELAYS

1. CANCER IS DISTINCTLY UNCOMMON IN CHILDHOOD –SO NOT THOUGHT OF AS ONE OF THE DIFFERENTIAL DIAGNOSIS (150 /MILLION CHILDREN).

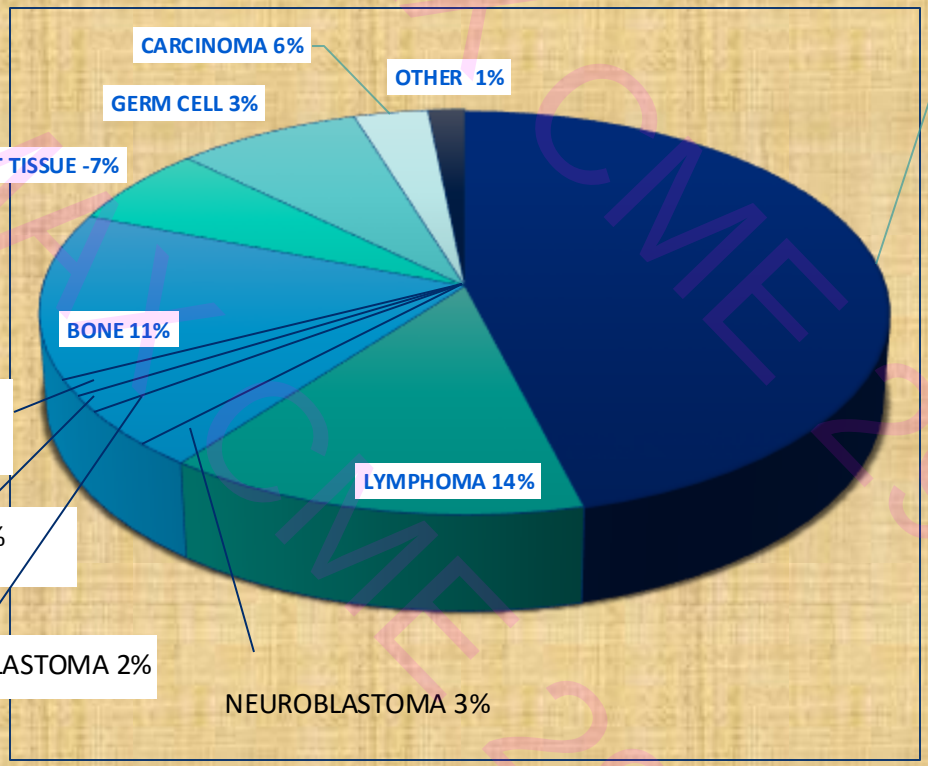
2. CLASSIC TELL TALE SYMPTOMS AND SIGNS MAY BE CONFUSING

3. DUE TO EXTREMELY POOR HEALTH AND DIAGNOSTIC FACILITIES IN PERIPHERAL CENTRES .

4. RELUCTANCE TO ENTERTAIN DIAGNOSIS BY PARENTS AND CARE GIVERS –LEADING TO WRONG TREATMENT (SEEKING ALTERNATIVE MODALITY OF TREATMENT).

DELAY LEADS TO HIGH COMPLICATION RATE AND POOR OUTCOMES

DISTRIBUTION OF 12 COMMON CHILDHOOD CANCERS, AGED 0-19 YEARS, INDIA, 2012 -2024 (HBCR)



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HOW ARE PEDIATRIC CANCERS DIFFERENT FROM ADULT CANCERS

ADULT CANCERS	PEDIATRIC CANCERS
RELATIVELY COMMON	RARE
CARCINOMAS (SOLID ORGAN) MOST COMMON	HEMATOLOGICAL CANCERS ,EMBRYONIC AND SARCOMAS ARE COMMON
ETIOLOGY MOSTLY –ENVIORMENTAL EXPOSURE	NO ENVIORMENTAL EXPOSURE IN 90% (ESPECIALLY IN HEMATOLOGICAL)
OFTEN CHEMO INSENSITIVE	OFTEN CHEMO SENSITIVE
LOW OR INTERMEDIATE GRADE LESS CURABLE	HIGH GRADE HIGHLY CURABLE
INCREASED INCIDENCE WITH INCREASING AGE	VARIABLE AGE BASED INCIDENCE

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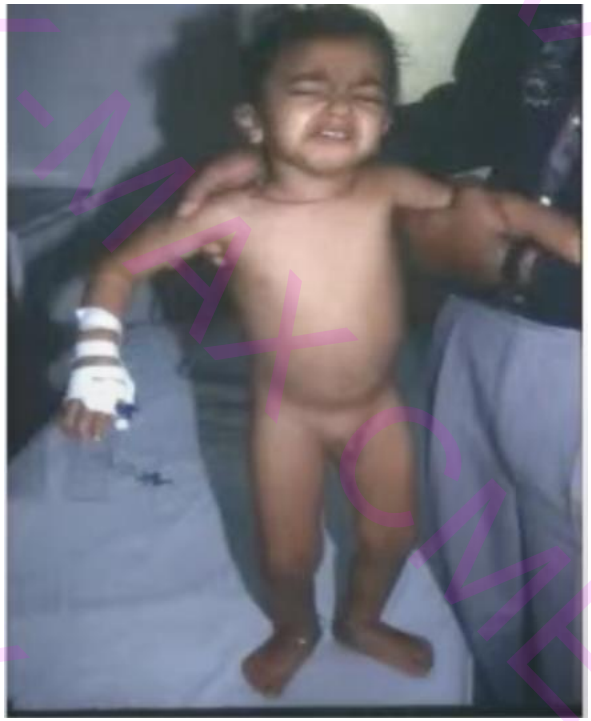
CASE 1

HISTORY-

- 3 YEAR OLD MALE
- FEVER ON AND OFF FOR 15-20 DAYS
- LISTLESS –DOES NOT WANT TO PLAY
- POOR APPETITE

CASE 1 CONTINUED…



ON GENERAL EXAMINATION –

- CHILD LOOKED VISIBLY IRRITABLE
- PALLOR ++
- NO LYMPHADENOPATHY

S/E- LIVER 2 CM & SPLEEN JUST PALPABLE

REST S/E-WNL

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CASE 1 CONTINUED…

DIFFERENTIAL DIAGNOSES –

- VIRAL FEVER
- ENTERIC FEVER
- MALARIA

INVESTIGATIONS-

CBC WITH PERIPHERAL SMEAR -HB -7.6 WBC -38,000 N -12 L -88 PLT -1.5 LAC

PERIPHERAL SMEAR –SHOWS LYMPHOCYTOSIS & PLTS ADEQUATE.

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CASE 1 CONTINUED…

WHAT PROMPTED US TO GO AHEAD AND DO THE BONE MARROW ?

PATIENT NOT RESPONDING TO ANTIPYRETICS AND ANTIBIOTICS . PERSISTENT FEVER

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CASE 1 CONTINUED …..

BONE MARROW ASPIRATION AND BIOPSY –SUGGESTIVE OF **ACUTE LEUKEMIA** AND FLOW CYTOMETRY WAS SUGGESTIVE OF **B CELL ACUTE LYMPHOBLASTIC LEUKEMIA**

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COMMON SYMPTOMS AND SIGNS OF A CHILD WITH LEUKEMIA

SYMPTOMS-

FEVER
FATIGUE
BONY PAIN
BLEEDING MANIFESTATIONS LIKE -PURPURA /PETECHAIE/ GUM BLEEDING / ECCHYMOSIS/BRUISES
SIGNIFICANT WEIGHT LOSS
LOSS OF APPETITE
NIGHT SWEATS

SIGNS

- PALLOR
- STERNAL TENDERNESS
- LYMPHADENOPATHY
- HEPATOSPLENOMEGALY

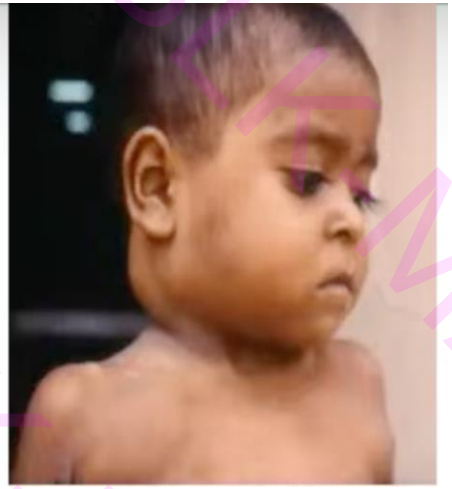
MEDIASTINAL MASS-MASS -IN NECK , ORBITAL AND SCROTAL AREA

WHEN SHOULD FEVER BECOME WORRISOME ??

PROLONGED FEVER , UNEXPLAINED /PERSISTENT FEVER >2 WEEKS DURATION.

NOT RESPONSIVE TO ANTIBIOTICS /ATT.

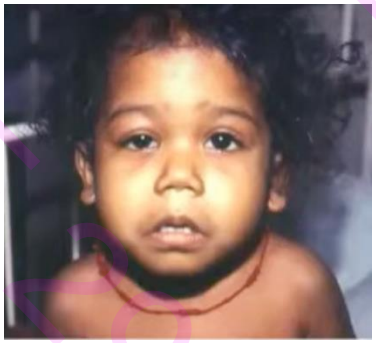
IN THE ABSENCE OF AN INFECTIVE BASIS - ITS SHOULD AROURSE SUSPICION OF OTHER CAUSES LIKE RARE INFECTIONS , AUTOIMMUNE DISORDERS , NEOPLASTIC PROCESS.

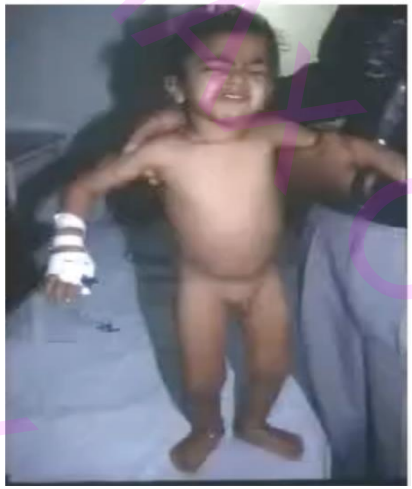


5 P's of leukemia –pyrexia, pallor, pain, petechiae, peripheral blood blasts

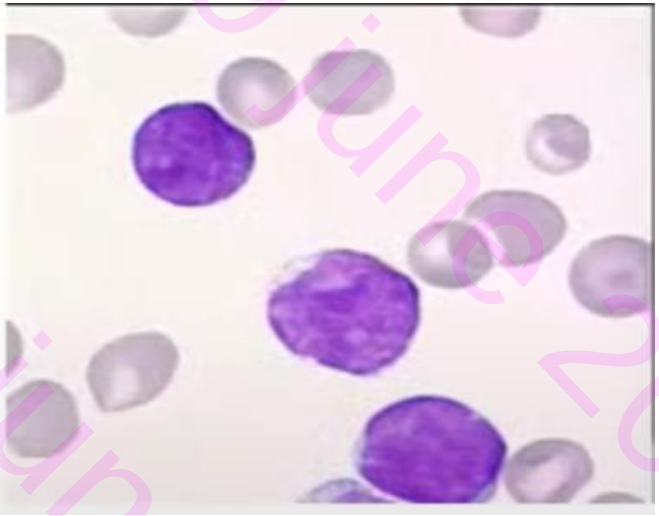
GENERALIZED LYMPHADENOPATHY & HEPATOSPLENOMEGALY

Pallor & Petechiae





ACUTE LEUKEMIA OR MARROW INVOLVEMENT



Unable to walk –Bone pain and Joint Pain (mimics JIA)

CBC & Careful P/S Examination can clinch the diagnosis – lymphocytosis , Bicytopenia /Pancytopenia ,Presence of immature cells or atypical cells

DIFFERENTIAL DIAGNOSES OF ACUTE LEUKEMIA -

NON MALIGNANT CONDITIONS –

INFECTIOUS MONONUCLEOSIS
JUVENILE IDIOPATHIC ARTHRITIS
APLASTIC ANEMIA
ITP (IMMUNE THROMBOCYTOPENIA)

MALIGNANT CONDITIONS-
METASTATIC NEUROBLASTOMA / RHABDOMYOSARCOMA /RETINOBLASTOMA

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CASE 2

- 11 YEAR OLD GIRL WITH PROGRESSIVE SWELLING IN NECK SINCE 4 MONTHS.
- 7 KG WEIGHT LOSS IN LAST 2 MONTHS .
- DRENCHING NIGHT SWEATS .
- NO COUGH , NO ABDOMINAL DISTENSION, NO BACKACHE
- NO HISTORY OF TUBERCULOSIS OR CHRONIC ILLNESS IN CLOSE FAMILY MEMBERS.

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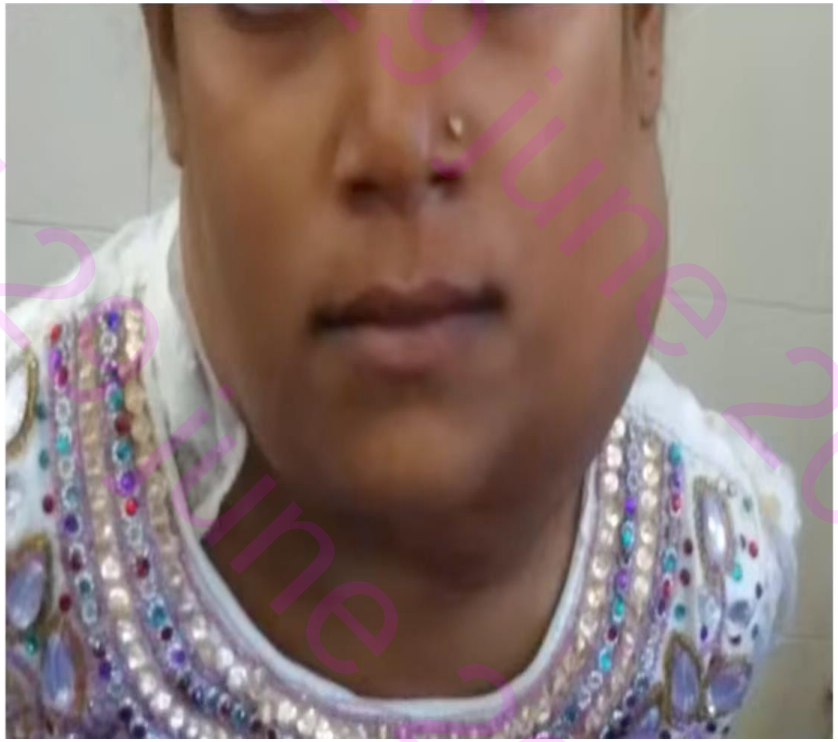
CASE 2 CONTINUED ….

ON EXAMINATION –

- BILATERAL CERVICAL LYMPH NODES (L >R)
- NO OTHER LYMPH NODES
- NO OBVIOUS HEPATOSPLENOMEGALY ON PALPATION

CASE 2 CONTINUED ….

- THIS WAS THE CHILD WITH LYMPH NODE WHICH WAS PROGRESSIVE IN NATURE.
- IT WAS GROWING IN SIZE DESPITE ANTIBIOTICS .
- FNAC DONE WAS INCONCLUSIVE AND ATT WAS STARTED EMPERICALLY AND DESPITE TREATMENT FOR TWO WEEKS,PATIENT DID NOT SHOW ANY SIGNS OF IMPROVEMENT .
- CBC WAS ABSOLUTELY NORMAL



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CASE 2 CONTINUED…

PATIENT WAS REFRERRED TO HEMAT OPD AND SHE WAS EVALUATED FURTHER

ON HAVING A CLOSER LOOK AT THE CHILD'S REPORTS

HER BIOCHEMICAL PARAMETERS WERE DERANGED

-KFT WAS DERANGED (OUTSIDE REPORT)

- CREAT -1.5
- URIC ACID -6.4
- PHOSPHORUS -6.6
- POTASSIUM -5.6
- CALCIUM WAS 6.8

USG WHOLE ABDOMEN WAS SUGGESTIVE OF – MILD SPLENOMEGALY (14. 5 CM)

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CASE 2 CONTINUED…

FURTHER EVALUATION REVEALED

-LDH -1950

-KFT WAS DERANGED
CREAT -1.9, URIC ACID-7.8, PHOSPHORUS -6.4 ,POTASSIUM -5.7 CALCIUM -6.2

WHAT ARE WE THINKING AT THIS POINT OF TIME?
?INFECTION

CERTAINLY NOT AT THIS STAGE WHEN CHILD HAS NOT RESPONDED TO ANTIBIOTICS AS WELL AS ATT WE SHOULD CERTAINLY THINK OF RULING OUT **MALIGNANCY**

ANOTHER IMP AND VERY CRUCIAL CLUE IS TUMOUR LYSIS AND RAISED LDH .

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CASE 2 CONTINUED…

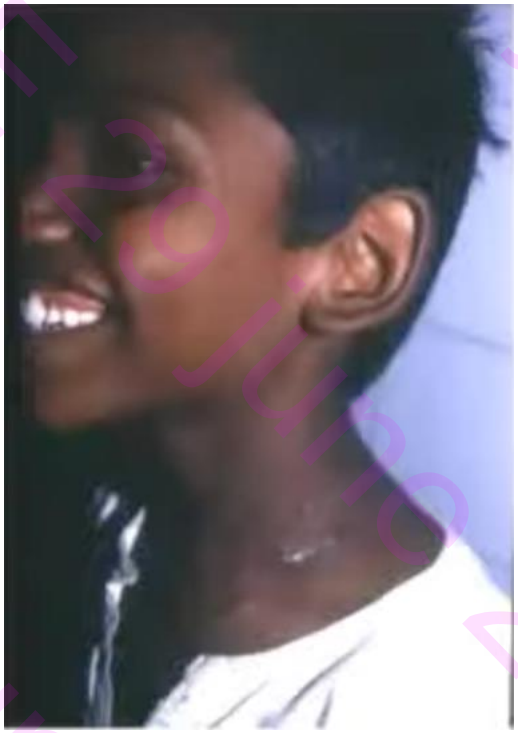
NON CONTRAST WHOLE BODY PET CT SCAN –SHOWED FDG AVID LYMPH NODES WITH SUV UPTAKE IN BILATERAL CERVICAL AREA 15.9 (LEFT SIDE) & 11.2 (RT SIDE)RESPECTIVELY . REST OF THE PETCT WAS NORMAL.

EXCISIONAL BIOPSY OF THE LYMPH NODE WAS SUGGESTIVE OF **LYMPHOMA**

& FURTHER CHARACTERIZION BY IHC CONFIRMED THE DIAGNOSIS OF **HODGKIN LYMPHOMA**

LYMPHADENOPATHY

- IT IS A TERM THAT REFERS TO LYMPH NODES THAT ARE ABNORMAL IN SIZE , NUMBER AND CONSISTENCY .
- LYMPH NODES MAY BE PALPABLE IN HEALTHY AS WELL AS SICK CHILDREN.
- NOT ALL PALPABLE LYMPH NODES ARE PATHOLOGICAL.



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SIMPLE FACTS REGARDING LYMPHADENOPATHY

- EXAMINATION OF LYMPH NODES IS AN INTEGRAL PART OF GENERAL PHYSICAL EXAMINATION AND CAN BE AN IMPORTANT CLUE TO UNDERLYING SYSTEMIC DISEASE.
- CHALLANGE FOR THE GENERAL PEDIATRICIAN TO IDENTIFY PATHOLOGICAL NODES.
- ITS ASSOCIATION WITH MALIGANACY –PARENTAL ANXIETY.
- CORRECT RECOGNITION OF NON PATHOLOGICAL NODES.
- REASSURANCE

LYMPHADENOPATHY :WHEN TO WORRY

CLUES-PAINLESS, ASSOCIATED WITH

- FEVER
- ANEMIA
- ORGANOMEGALY

SIGNFICANT SIZE >10 MM

- CERVICAL NODES- >10 MM DIAMETER IS CONSIDERED ENLARGED.
- AXAILLRY NODES- >10 MM DIAMETER IS CONSIDERED ENLARGED.
- INGUINAL >15 MM DIAMETER IS CONSIDERED ENLARGED

UNUSUAL SITE (SUPRACLAVICULAR AND MEDIASTINAL)

NON –RESPONSIVE TO ANTIBIOTICS /ATT

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CASE 3

- 9 YEAR OLD GIRL FROM RANCHI PRESENTED TO OPD WITH PERSISTENT COUGH, HOARSENESS OF VOICE FOR 20 DAYS , DIFFICULTY IN SWALLOWING AND GRADUALLY INCREASING DYSPNOEA FOR 15 DAYS .
- HISTORY OF HIGH GRADE FEVER FOR 7 DAYS (T MAX -103 DEGREE F).
- SHE WAS STARTED ON ALTERNATIVE MODALITY OF TREATMENT –PATIENT DID NOT SHOW ANY SIGNS OF IMPROVEMENT (RATHER HER SIGNS AND SYMPTOMS WORSENED).
- NO HISTORY OF SIGNIFICANT WEIGHT LOSS, NO JOINT PAIN, LOSS OF APPETITE OR DRENCHING NIGHT SWEATS.

CASE 3 CONTINUED

ON EXAMINATION –

MILD PALLOR+
NO LYMPHADENOPATHY
UPPER BODY EDEMA
JUGULAR VEIN DISTENSION

R/S-ABSENT AIR ENTRY LEFT UPPER ZONE

PER ABDOMEN – LIVER 3 CM BELOW RCM AND SPLEEN NP

REST S/E -WNL

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CASE 3 CONTINUED ….

DIFFERENTIAL DIAGNOSES

LYMPHOMA

GERM CELL TUMOR

THYMOMA

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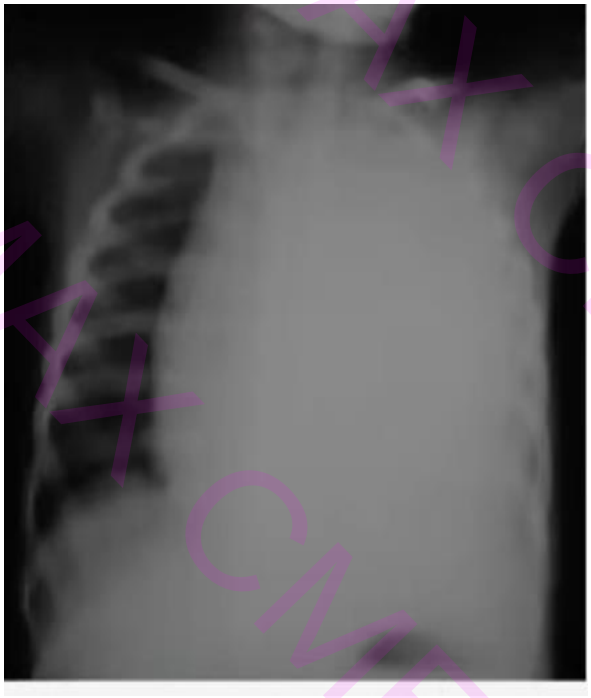
CASE 3 CONTINUED….

CBC & PERIPHERAL SMEAR –HB -8.1 MCV -69.6 TLC -12,400 N -72
PLT -3.02 LAC & NO ATYPICAL CELLS

KFT – URIC ACID– 13 MG/DL LDH -2830 IU /L

CASE 3 CONTINUED….



HUGE ANTERIOR MEDIASTINAL MASS

CHEST XRAY WAS SUGGESTIVE OF

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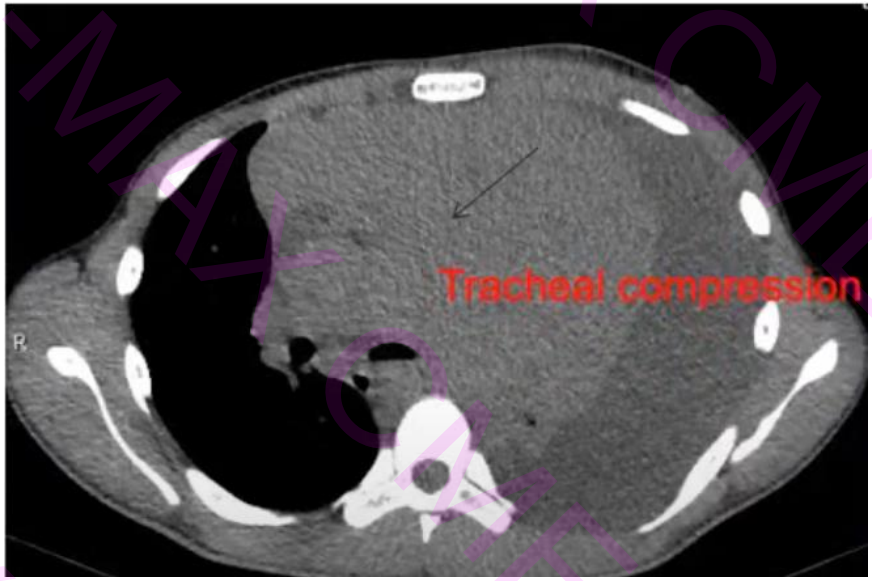
CASE 3 CONTINUED…



CT SCAN –LARGE SOLID ANTERIOR MEDIASTINAL MASS

WITH TRACHEAL COMPRESSION AND PLEURAL EFFUSION

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CASE 3 CONTINUED….

PLEURAL TAP – PRESENCE OF MALIGNANT CELLS

TRUCUT BIOPSY OF THE MASS WAS SUGGESTIVE OF NON HODGKIN LYMPHOMA

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CASE 3 CONTINUED ….

CLUE TO DIAGNOSIS-

- PRESENCE OF ANTERIOR MEDIASTINAL MASS WITH COMPRESSIVE SYMPTOMS
- SHORT HISTORY WITH SUCH RAPIDLY PROGRESSIVE SYMPTOMS
- BIOCHEMICAL EVIDENCE OF TLS & RAISED LDH

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CASE 3 CONTINUED…..

TRUCUT BIOPSY OF THE LYMPH NODE BIOPSY SUGGESTIVE OF NON HODGKIN LYMPHOMA

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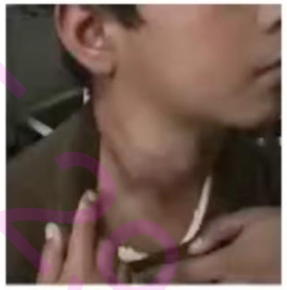
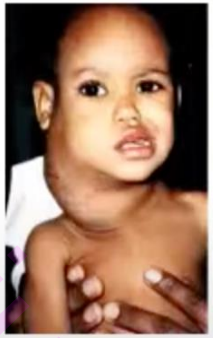
MEDIASTINAL MASS

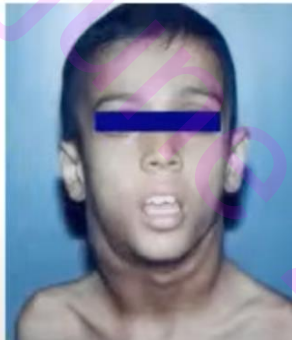
	ANTERIOR OR MIDDLE MEDIASTINUM	POSTERIOR MEDIASTINUM
BENIGN	THYMIC HYPERPLASIA TERATOMA LIPOMA/ANGIOMA ECTOPIC THYROID BRONCHOGENIC / PERICARDIAL CYST	NEUROFIBROMA NEURILEMMOMA THORACIC MENINGOCELE ENETROGENOUS CYSTS AORTIC ANEURYSM
MALIGNANT	NHL/LEUKEMIA GERM CELL TUMOUR HODGKIN LYMPHOMA	NEUROBLASTOMA PNET RHABDOMYOSARCOMA NHL (UNCOMMON)

NECK MASS-DIFFERENTIAL DIAGNOSES

- INFECTIOUS MONONUCLEOSIS
- REACTIVE HYPERPLASIA
- TUBERCULOSIS
- LEUKEMIA
- LYMPHOMA
- CYSTIC HYGROMA (COMMONEST IN
- LESS THAN 2 YEARS OF AGE)
- SARCOMA







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COMMON PRESENTATION

	SYMPTOM	DISEASE
1.	RECURRENT FEVER WITH BONE PAIN	LEUKEMIA NEUROBLASTOMA EWINGS SARCOMA
2.	NODES IN NECK NOT RESPONDING TO ANTIBIOTICS / ANTI TUBERCULAR THERAPY	LEUKEMIA LYMPHOMA
3.	PALLOR , FATIGUE , LOSS OF WEIGHT LOSS	LEUKEMIA LYMPHOMA
4.	MASS IN ABDOMEN	WILM'S TUMOR NEUROBALSTOMA HEPATOBLASTOMA
5.	PERSISTENT HEADCAHE AND VOMITING	BRAIN TUMOR LEUKEMIA

	SYMPTOM	DISEASE
6.	WHITE LESION IN EYE	RETINOBLASTOMA
7.	BACK PAIN , URINE RETENTION , FREQUENCY , CONSTIPATION	RHABDOMYOSARCOMA , EWINGS SARCOMA AND GERM CELL TUMOR.
8.	CHRONIC EAR DISCHARGE	LCH AND RHABDOMYOSARCOMA
9.	EXTREMITY MASS	OSTEOSARCOMA EWINGS SARCOMA RHABDOMYOSARCOMA
10.	ORBITAL MASS	LYMPHOMA , LEUKEMIA RHABDOMYOSARCOMA
11.	SCROTAL MASS	LYMPHOMA , LEUKEMIA RHABDOMYOSARCOMA

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TAKE HOME MESSAGE

- ✓ CANCER IN CHILDREN IS A CLNICALLY HETEROGENOUS DISEASE.
- ✓ SIGNS AND SYMPTOMS MIMIC COMMON PEDIATRIC CONDITIONS .
- ✓ EARLY RECOGNITION AND RAPID DIAGNOSIS ARE ESSENTIAL TO IMPROVE SURVIVAL.
- ✓ PEDIATRICIANS HAVE AN IMPORATNT ROLE TP PLAY AND A HIGH INDEX OF SUSPICION SHOULD BE KEPT IN CHILDREN NOT RESPONDING TO CONVENTIONAL TREATMENT.
- ✓ MOST CHILDHOOD LEUKEMIA'S AND LYMPHOMA'S HAVE HIGH CURE RATES AND OVER ALL MOST PEDIATRIC CANCERS HAVE GOOD PROGNOSIS

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THANK YOU