RESULTS

-This study was done on 33 patients with newly diagnosed acute lymphoblastic leukaemia. The study included 19 male and 14 females with a ratio of 1.3: 1. The age of children ranged from 1-14 years. These patients were attended to internal medicin Hematology – Oncoloby unit and pediatric department, Zagazig University Hospital.

Presenting Symptoms:

-The most common symptoms are fever, pallor and purpura (Table 13 and Figure 17).

Table (13): Presenting symptoms of the studied patients :

		Frequency	Percent	Valid Percent
Fever	Negative	14	42.4	42.4
	Positive	19	57.6	57.6
	Total	33	100.0	100.0
Pallor	Negative	17	51.5	51.5
	Positive	16	48.5	48.5
	Total	33	100.0	100.0
Purpura	Negative	19	57.6	57.6
	Positive	14	42.4	42.4
	Total	33	100.0	100.0
Others	None	19	57.6	57.6
	bleedig gum	1	3.0	3.0
	Bone pain	4	12.1	12.1
	buffyeylids	1	3.0	3.0
	dyspnea	1	3.0	3.0
	epistaxis	3	9.1	9.1
	Fatigue	1	3.0	3.0
	headache	1	3.0	3.0
	ovarian mass	1	3.0	3.0
	Weight loss	1	3.0	3.0
	Total	33	100.0	100.0

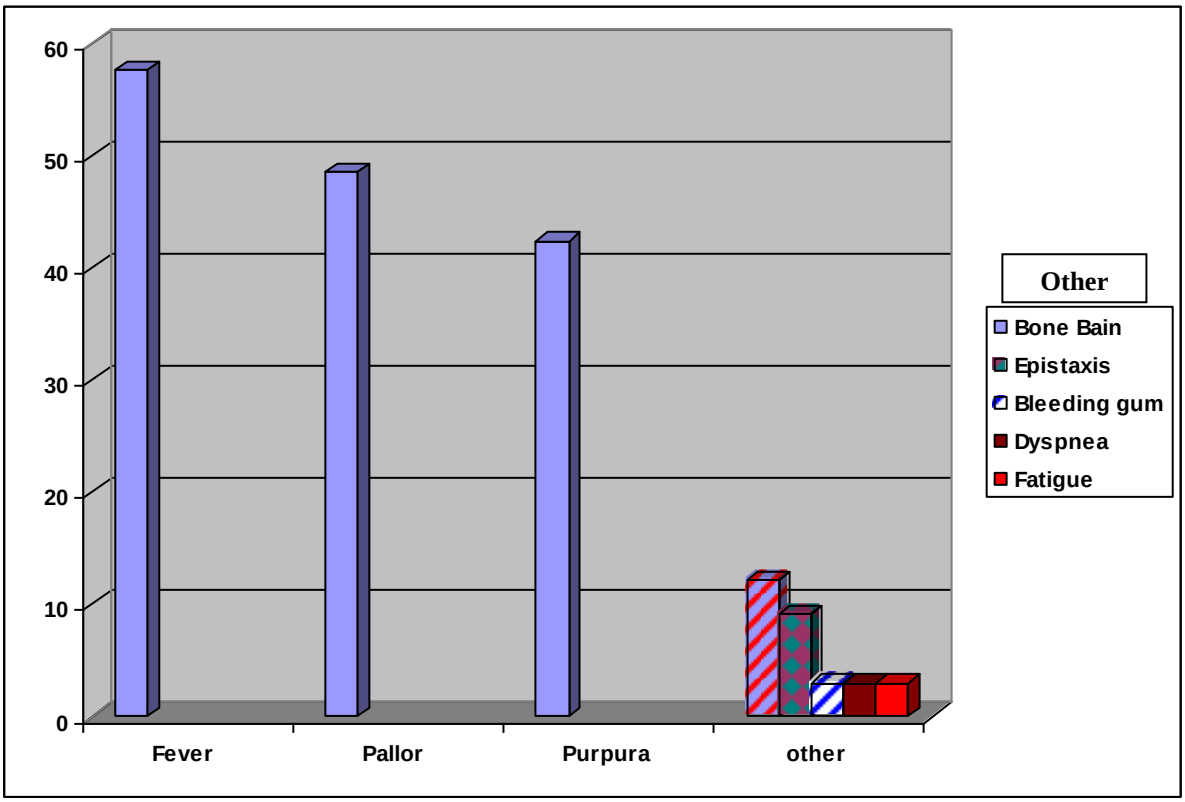


Figure (17):Percente of presenting symptoms [other symptoms in the form of bone bain (12.1%), epistaxis (9.1%), bleeding gum (3.0%), dyspnea (3.0%) and fatigue (3.0%)]

Clinical examination:

Table (14): Clinical examination results

		Frequency	Percent	Valid Percent
Hepatomegally	Negative	13	39.4	39.4
	Positive	20	60.6	60.6
	Total	33	100.0	100.0
Splenonegally	Negative	11	33.3	33.3
	Positive	22	66.7	66.7
	Total	33	100.0	100.0
Lymphadenopathy	Negative	8	24.2	24.2
	Positive	25	75.8	75.8
	Total	33	100.0	100.0

-The clinical examination revealed that lymphadenopathy is the most common sign followed by splenomegally and hepatomegally.

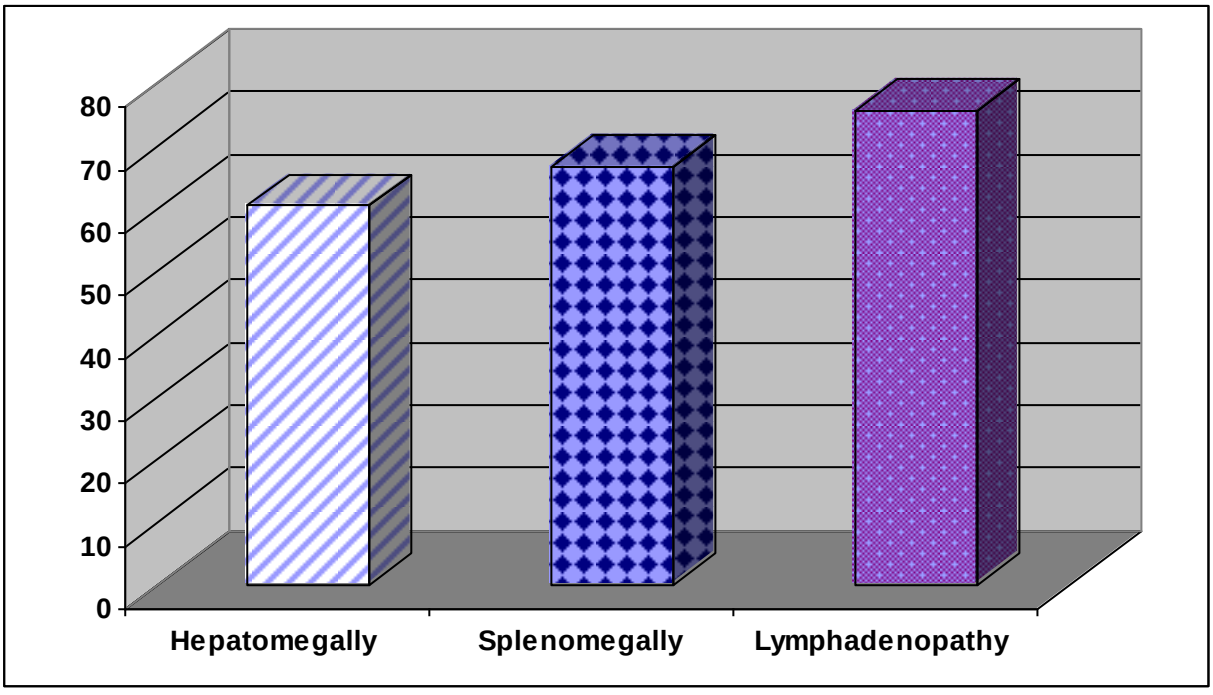


Figure (18): Clinical examination results

Haematological data :

-Table (15) and Figure (17) show the haematological data of patients at diagnosis. It include hemoglobin concentration (Hb), total leucocytic No. (TLC), platelet No. (PLT) and blasts percent in the peripheral blood.

Table (15): Haematological data of the studied patients

		Frequency	Percent	Valid Percent
Anaemia	Negative	3	9.1	9.1
	Positive	30	90.9	90.9
	Total	33	100.0	100.0
TLC	Leucopenia	4	12.1	12.1
	Normal TLC	9	27.3	27.3
	Leucocytosis	20	60.6	60.6
	Total	33	100.0	100.0
Thrombocytopenia	Negative	3	9.1	9.1
	Positive	30	90.9	90.9
	Total	33	100.0	100.0
PB blasts %	<20%	3	9.1	9.1
	>20%	30	90.9	90.9
	Total	33	100.0	100.0

This table shows: the anaemia and thrombocytopenia are present in most cases

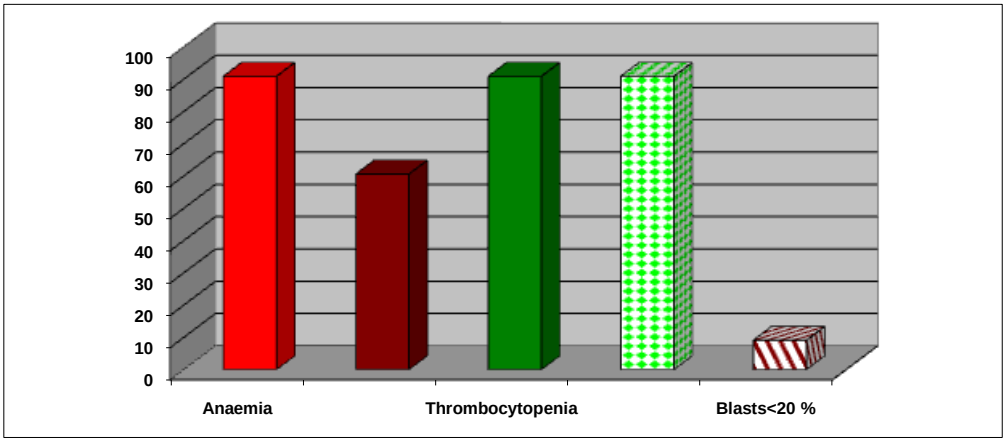


Figure (19): Haematological data
(Anaemia, thrombocytopemia leukcocytosis and blasts % in peripheral blood)

FAB classification

Table (16): FAB classification

		Frequency	Percent	Valid Percent
Classification	L1	13	39.4	39.4
	L2	18	54.5	54.5
	L3	2	6.1	6.1
	Total	33	100.0	100.0

L2 is the most frequent classification in childhood ALL

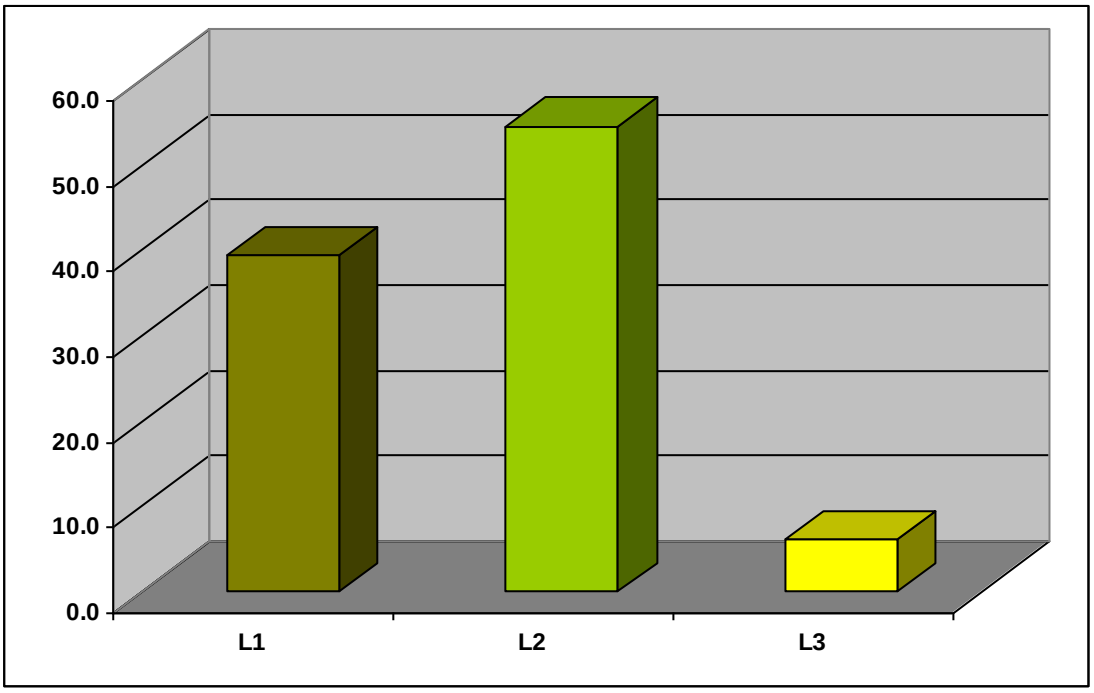


Figure (20): Distribution of FAB Classification

Bone marrow cellularity:

-Table (17) and Figure (19) show:

Hypercellular bone marrow in 20 cases , Hypocelluler BM in 7 cases, hypocellulaer BM in 7 cases, normocellular BM in 6 cases. Blasts are more than 50% in 31 cases.

Table (17): BM Cellularity :

		Frequency	Percent	Valid Percent
BM Cellularity	Hypercellular	20	60.6	60.6
	Hypocellulaer	7	21.2	21.2
	Normocellular	6	18.2	18.2
	Total	33	100.0	100.0

Hypercellular BM is the most common finding with the stuied patients.

Biochemical analysis :

Table (18): Showes : serumLDH and uric acid levels

		Frequency	Percent	Valid Percent
LDH	Normal	13	39.4	39.4
	High	20	60.6	60.6
	Total	33	100.0	100.0
Uric Acid	Normal	18	54.5	54.5
	High	15	45.5	45.5
	Total	33	100.0	100.0

-Hyperuricemia represent 54.5% in studied patients, whearase (60.6%) of patients had high level of LDH.

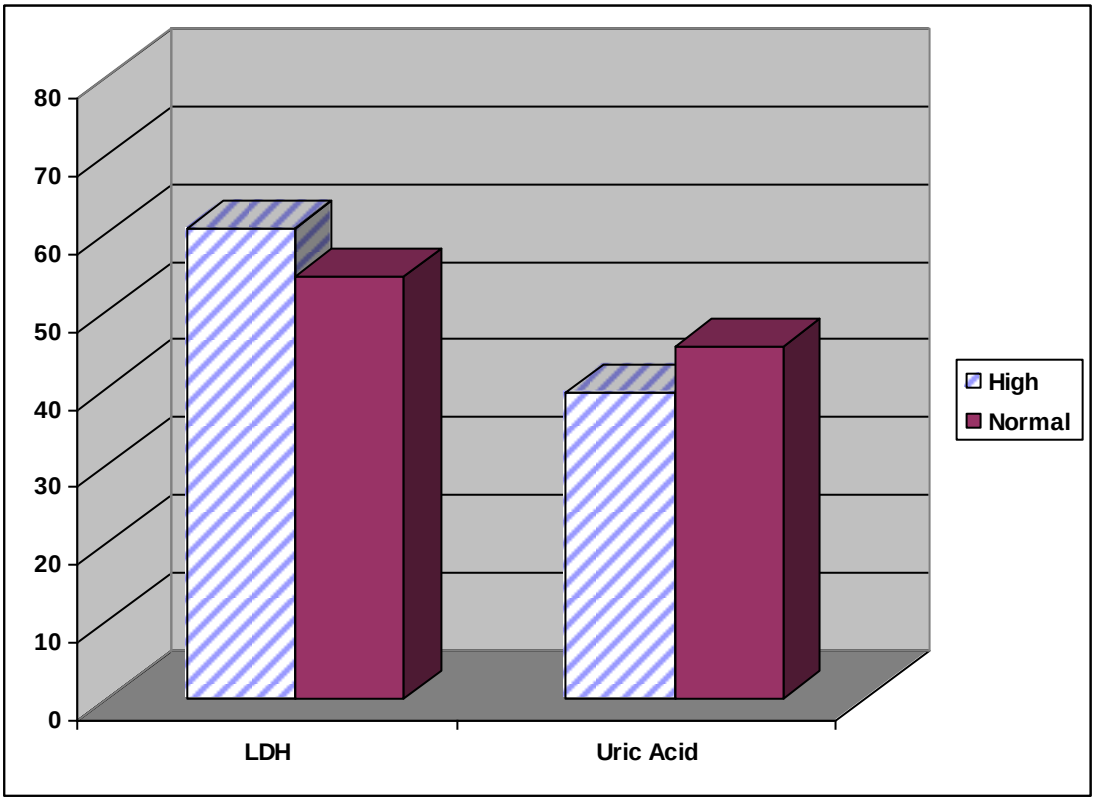


Figure (21): Distribution of hyperuricemia and LDH

Immuhnophenotyping;

Table (19): Immunophenotyping classification in childhood ALL:

		Frequency	Percent	Valid Percent
Type	Pro-B	1	3.0	3.0
	C-ALL	15	45.3	45.3
	pre-B	6	18.2	18.2
	B-ALL	2	6.1	6.1
	T-early	2	6.1	6.1
	T-intermediate	2	6.1	6.1
	T-late	2	6.1	6.1
	Bilineage	2	6.1	6.1
	Biphenotypic	1	3.0	3.0
	Total	33	100.0	100.0

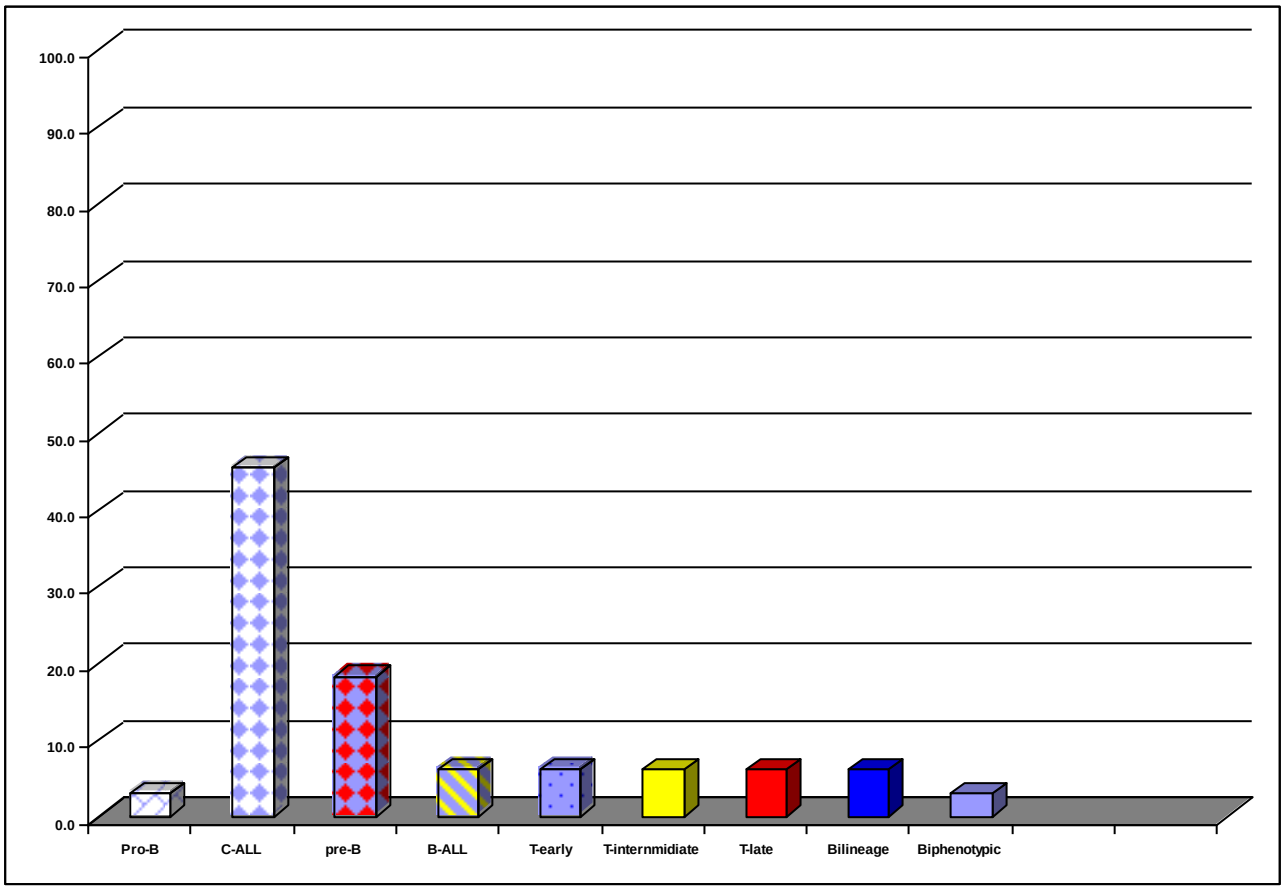


Figure (22): The percent of immunophenotyping of childhood ALL : C-ALL is the most frequent (45.3%)

Table (20): Percent of B-cell ALL, mixed and T-cell ALL.

		Frequency	Percent	Valid Percent
Type	B-cell	24	72.7	72.7
	Mixed	3	9.1	9.1
	T-cell	6	18.2	18.2
	Total	33	100.0	100.0

Table (21): Different monoclonal antibodies used in flow cytometry to diagnose chidlhood ALL.

		Frequency	Percent	Valid Percent
CD2	Negative	30	90.9	90.9
	Positive	3	9.1	9.1
	Total	33	100.0	100.0
CD3	Negative	29	87.9	87.9
	Positive	4	12.1	12.1
	Total	33	100.0	100.0
CD4	Negative	31	93.9	93.9
	Positive	2	6.1	6.1
	Total	33	100.0	100.0
CD5	Negative	26	78.8	78.8
	Positive	7	21.2	21.2
	Total	33	100.0	100.0
CD7	Negative	25	75.8	75.8
	Positive	8	24.2	24.2
	Total	33	100.0	100.0
CD8	Negative	32	97.0	97.0
	Positive	1	3.0	3.0
	Total	33	100.0	100.0
CD10	Negative	8	24.2	24.2
	Positive	25	75.8	75.8
	Total	33	100.0	100.0
CD13	Negative	29	87.9	87.9
	Positive	4	12.1	12.1
	Total	33	100.0	100.0
CD19	Negative	8	24.2	24.2
	Positive	25	75.8	75.8
	Total	33	100.0	100.0
CD20	Negative	24	72.7	72.7
	Positive	9	27.3	27.3

	Total	33	100.0	100.0
CD22	Negative	6	18.2	18.2
	Positive	27	81.8	81.8
	Total	33	100.0	100.0
CD33	Negative	30	90.9	90.9
	Positive	3	9.1	9.1
	Total	33	100.0	100.0
CD34	Negative	20	60.6	60.6
	Positive	13	39.4	39.4
	Total	33	100.0	100.0
CD79a	Negative	28	84.8	84.8
	Positive	5	15.2	15.2
	Total	33	100.0	100.0
TdT	Negative	19	57.6	57.6
	Positive	14	42.4	42.4
	Total	33	100.0	100.0
Cytμ	Negative	28	84.8	84.8
	Positive	5	15.2	15.2
	Total	33	100.0	100.0
HLA-DR	Negative	8	24.2	24.2
	Positive	25	75.8	75.8
	Total	33	100.0	100.0
MPO	Negative	8	24.2	24.2
	Positive	25	75.8	75.8
	Total	33	100.0	100.0

Table (22): CD2 in B-ALL, mixed and T-ALL

			Type			Total
			B-cell	Mixed	T-cell	
CD2	Negative	No.	24	3	3	30
		% within CD2	80.0%	10.0%	10.0%	100.0%
		% within Type	100.0%	100.0%	50.0%	90.9%
	Positive	No.	0	0	3	3
		% within CD2	0.0%	0.0%	100.0%	100.0%
		% within Type	0.0%	0.0%	50.0%	9.1%
Total		No.	24	3	6	33
		% within CD2	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

(P=0.004 which is statistically and clinically significant in T-lineage)

Table (23): CD3 in B-ALL, mixed and T-ALL

			Type			Total
			B-cell	Mixed	T-cell	
CD3	Negative	No.	24	2	3	29
		% within CD3	82.8%	6.9%	10.3%	100.0%
		% within Type	100.0%	66.7%	50.0%	87.9%
	Positive	No.	0	1	3	4
		% within CD3	0.0%	25.0%	75.0%	100.0%
		% within Type	0.0%	33.3%	50.0%	12.1%
Total		No.	24	3	6	33
		% within CD3	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

(P=0.004 which is statistically and clinically significant in T-lineage)

Table (24): CD4 in B-ALL, mixed and T-ALL

			Type			
			B-cell	**Mixed**	**T-cell**	**Total**
CD4	**Negative**	No.	24	3	4	31
		% within CD4	77.4%	9.7%	12.9%	100.0%
		% within Type	100.0%	100.0%	66.7%	93.9%
	Positive	No.	0	0	2	2
		% within CD4	0.0%	0.0%	100.0%	100.0%
		% within Type	0.0%	0.0%	33.3%	6.1%
Total		No.	24	3	6	33
		% within CD4	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

(P=0.03 which is statistically and significant in T- lineage).

Table (25): CD5 in different types and subtypes of ALL

			Type									
			Pro-B	C-ALL	pre-B	B-ALL	early-T	T-internmidiate	T-ALL	Bilineage	Biphenotypic	Total
CD5	Negative	No.	1	15	6	2	0	0	0	1	1	26
		% within CD5	3.8%	57.7%	23.1%	7.7%	0.0%	0.0%	0.0%	3.8%	3.8%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%	50.0%	100.0%	78.8%
	Positive	No.	0	0	0	0	2	2	2	1	0	7
		% within CD5	0.0%	0.0%	0.0%	0.0%	28.6%	28.6%	28.6%	14.3%	0.0%	100.0%
		% within Type	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	50.0%	0.0%	21.2%
Total		No.	1	15	6	2	2	2	2	2	1	33
		% within CD5	3.0%	45.5%	18.2%	6.1%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

(P < 0.001 highly significant CD5 in expressed on T-lineage).

Table (26): CD5 in B-ALL, mixed and T-ALL

			Type			Total
			B-cell	Mixed	T-cell	
CD5	Negative	No.	24	2	0	26
		% within CD5	92.3%	7.7%	0.0%	100.0%
		% within Type	100.0%	66.7%	0.0%	78.8%
	Positive	No.	0	1	6	7
		% within CD5	0.0%	14.3%	85.7%	100.0%
		% within Type	0.0%	33.3%	100.0%	21.2%
Total		No.	24	3	6	33
		% within CD5	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

(P < 0.001. about 100% of T-cell ALL expressed CD5)

Table (27): CD7 in different types and subtypes of ALL

			Type									
			Pro-B	C-ALL	Pre-B	B-ALL	early-T	T-internmidiate	T-ALL	Bilineage	Biphenotypic	Total
CD7	Negative	No.	1	14	6	2	0	0	0	1	1	25
		% within CD7	4.0%	56.0%	24.0%	8.0%	0.0%	0.0%	0.0%	4.0%	4.0%	100.0%
		% within Type	100.0%	93.3%	100.0%	100.0%	0.0%	0.0%	0.0%	50.0%	100.0%	75.8%
	Positive	No.	0	1	0	0	2	2	2	1	0	8
		% within CD7	0.0%	12.5%	0.0%	0.0%	25.0%	25.0%	25.0%	12.5%	0.0%	100.0%
		% within Type	0.0%	6.7%	0.0%	0.0%	100.0%	100.0%	100.0%	50.0%	0.0%	24.2%
Total		No.	1	15	6	2	2	2	2	2	1	33
		% within CD7	3.0%	45.5%	18.2%	6.1%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

(P = 0.001 is statistically and clinically significant CD7 is a marker of T-lineage).

Table (28): CD7 in B-ALL, mixed and T-ALL

			Type			
			B-cell	Mixed	T-cell	Total
CD7	Negative	No.	23	2	0	25
		% within CD7	92.0%	8.0%	0.0%	100.0%
		% within Type	95.8%	66.7%	0.0%	75.8%
	Positive	No.	1	1	6	8
		% within CD7	12.5%	12.5%	75.0%	100.0%
		% within Type	4.2%	33.3%	100.0%	24.2%
Total		No.	24	3	6	33
		% within CD7	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

(P = < 0.001 is statistically and clinically significant. CD7 expressed on T-lineage)

Table (29): CD8 in B-ALL, mixed and T-ALL

			Type			
			B-cell	**Mixed**	**T-cell**	**Total**
CD8	**Negative**	No.	24	3	5	32
		% within CD8	75.0%	9.4%	15.6%	100.0%
		% within Type	100.0%	100.0%	83.3%	97.0%
	Positive	No.	0	0	1	1
		% within CD8	0.0%	0.0%	100.0%	100.0%
		% within Type	0.0%	0.0%	16.7%	3.0%
Total		No.	24	3	6	33
		% within CD8	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

P = 0.2 which statistically non significant.

Table (30): CD10 in B-ALL, mixed and T-ALL

			Type			
			B-cell	**Mixed**	**T-cell**	**Total**
CD10	**Negative**	No.	2	1	5	8
		% within CD10	25.0%	12.5%	62.5%	100.0%
		% within Type	8.3%	33.3%	83.3%	24.2%
	Positive	No.	22	2	1	25
		% within CD10	88.0%	8.0%	4.0%	100.0%
		% within Type	91.7%	66.7%	16.7%	75.8%
Total		No.	24	3	6	33
		% within CD10	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

P=0.001. 91.7% of CD10 on B-cell lineage (which is highly significant).

Table (31): CD13 in B-ALL, mixed and T-ALL

			Type			Total
			B-cell	**Mixed**	**T-cell**	
CD13	**Negative**	No.	21	2	6	29
		% within CD13	72.4%	6.9%	20.7%	100.0%
		% within Type	87.5%	66.7%	100.0%	87.9%
	Positive	No.	3	1	0	4
		% within CD13	75.0%	25.0%	0.0%	100.0%
		% within Type	12.5%	33.3%	0.0%	12.1%
Total		No.	24	3	6	33
		% within CD13	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

P = 0.3 statistically non significant because CD13 is a myeloid marker. Appearance of $CD13^+$ in lymphoid lineage is due to aberrant expression. In this table, mixed leneage had only one case express CD13.

Table (32): CD 19 in different types and subtypes of ALL

			Type									Total
			Pro-B	C-ALL	pre-B	B-ALL	early-T	T-internmidiate	T-ALL	Bilineage	Biphenotypic	
CD19	Negative	No.	0	0	2	0	2	2	2	0	0	8
		% within CD19	0.0%	0.0%	25.0%	0.0%	25.0%	25.0%	25.0%	0.0%	0.0%	100.0%
		% within Type	0.0%	0.0%	33.3%	0.0%	100.0%	100.0%	100.0%	0.0%	0.0%	24.2%
	Positive	No.	1	15	4	2	0	0	0	2	1	25
		% within CD19	4.0%	60.0%	16.0%	8.0%	0.0%	0.0%	0.0%	8.0%	4.0%	100.0%
		% within Type	100.0%	100.0%	66.7%	100.0%	0.0%	0.0%	0.0%	100.0%	100.0%	75.8%
Total		No.	1	15	6	2	2	2	2	2	1	33
		% within CD19	3.0%	45.5%	18.2%	6.1%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

P= 0.001. CD19+ is restricted to B. lineage (highly significant)

Table (33): CD19 in B-ALL, mixed and T-ALL

			Type			Total
			B-cell	Mixed	T-cell	
CD19	Negative	No.	2	0	6	8
		% within CD19	25.0%	0.0%	75.0%	100.0%
		% within Type	8.3%	0.0%	100.0%	24.2%
	Positive	No.	22	3	0	25
		% within CD19	88.0%	12.0%	0.0%	100.0%
		% within Type	91.7%	100.0%	0.0%	75.8%
Total		No.	24	3	6	33
		% within CD19	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

P=<0.001 highly significant (100% of cases of T-lineage are CD19 negative)

Table (34): CD20 in different types and subtypes of ALL

			Type									
			Pro-B	C-ALL	Pre-B	B-ALL	early-T	T-internmidiate	T-ALL	Bilineage	Biphenotypic	Total
CD20	Negative	No.	0	13	4	0	2	2	2	1	0	24
		% within CD20	0.0%	54.2%	16.7%	0.0%	8.3%	8.3%	8.4%	4.2%	0.0%	100.0%
		% within Type	0.0%	86.7%	66.7%	0.0%	100.0%	100.0%	100.0%	50.0%	0.0%	72.7%
	Positive	No.	1	2	2	2	0	0	0	1	1	9
		% within CD20	11.1%	22.2%	22.2%	22.2%	0.0%	0.0%	0.0%	11.1%	11.1%	100.0%
		% within Type	100.0%	13.3%	33.3%	100.0%	0.0%	0.0%	0.0%	50.0%	100.0%	27.3%
Total		No.	1	15	6	2	2	2	2	2	1	33
		% within CD20	3.0%	45.5%	18.2%	6.1%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

P= 0.005. CD20 is a pan marker of B-lineage (Statistically and clinically significant)

Table (35): CD22 in different types and subtypes of ALL

			Type									Total
			Pro-B	C-ALL	Pre-B	B-ALL	Early-T	T-internmidiate	T-ALL	Bilineage	Biphenotypic	
CD22	Negative	No.	0	0	0	0	1	2	2	1	0	6
		% within CD22	0.0%	0.0%	0.0%	0.0%	16.7%	33.3%	33.4%	%6.7%	0.0%	100.0%
		% within Type	0.0%	0.0%	0.0%	0.0%	50.0%	100.0%	100.0%	50.0%	0.0%	18.2%
	Positive	No.	1	15	6	2	1	0	0	1	1	27
		% within CD22	3.7%	55.6%	22.2%	7.4%	3.7%	0.0%	0.0%	3.7%	3.7%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	50.0%	0.0%	0.0%	50.0%	100.0%	81.8%
Total		No.	1	15	6	2	2	2	2	2	1	33
		% within CD22	3.0%	45.5%	18.2%	6.1%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

P= 0.003. statistically and clinically significant. CD22 is a marker of B-lineage

Table (36): CD34 in different types and subtypes of ALL

			Type									
			Pro-B	**C-ALL**	**Pre-B**	**B-ALL**	**Early-T**	**T-internmidiate**	**T-ALL**	**Bilineage**	**Biphenotypic**	**Total**
CD34	**Negative**	**No.**	0	8	6	2	0	2	2	0	0	20
		% within CD34	0.0%	40.0%	30.0%	10.0%	0.0%	10.0%	10.0%	0.0%	0.0%	100.0%
		% within Type	0.0%	53.3%	100.0%	100.0%	0.0%	100.0%	100.0%	0.0%	0.0%	60.6%
	Positive	**No.**	1	7	0	0	2	0	0	2	1	13
		% within CD34	7.7%	53.8%	0.0%	0.0%	15.4%	0.0%	0.0%	15.4%	7.7%	100.0%
		% within Type	100.0%	46.7%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%	100.0%	39.4%
Total		**No.**	1	15	6	2	2	2	2	2	1	33
		% within CD34	3.0%	45.5%	18.2%	6.1%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

P= 0.01. statistically and clinically significant CD34 expressed on precursor cells.

Table (37): CD33 in B-ALL, mixed and T-ALL

			Type			Total
			B-cell	Mixed	T-cell	
CD33	Negative	No.	21	3	6	30
		% within CD33	70.0%	10.0%	20.0%	100.0%
		% within Type	87.5%	100.0%	100.0%	90.9%
	Positive	No.	3	0	0	3
		% within CD33	100.0%	0.0%	0.0%	100.0%
		% within Type	12.5%	0.0%	0.0%	9.1%
Total		No.	24	3	6	33
		% within CD33	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

P = 0.6. statistically non significant CD33 is a myeloid marker

Table (38): MPO in B-ALL, mixed and T-ALL

			Type			Total
			B-cell	Mixed	T-cell	
MPO	Negative	No.	24	2	6	32
		% within MPO	75.0%	6.3%	18.8%	100.0%
		% within Type	100.0%	66.7%	100.0%	97.0%
	Positive	No.	0	1	0	1
		% within MPO	0.0%	100.0%	0.0%	100.0%
		% within Type	0.0%	33.3%	0.0%	3.0%
Total		No.	24	3	6	33
		% within MPO	72.7%	9.1%	18.2%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%

P=0.09 statistically non significant. MPO is a myeloid marke

Table (39): CD79a in different types and subtypes of ALL

			Type									Total
			Pro-B	C-ALL	Pre-B	B-ALL	early-T	T-internmidiate	T-ALL	Bilineage	Biphenotypic	
CD79a	Negative	No.	1	14	5	0	2	2	2	2	0	28
		% within CD79a	3.6%	50.0%	18.0%	00.0%	7.1%	7.1%	7.2%	7.1%	0.0%	100.0%
		% within Type	100.0%	93.3%	83.3%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	84.8%
	Positive	No.	0	1	1	2	0	0	0	0	1	5
		% within CD79a	0.0%	20.0%	20.0%	40.0%	0.0%	0.0%	0.0%	0.0%	20.0%	100.0%
		% within Type	0.0%	6.7%	16.7%	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%	15.2%
Total		No.	1	15	6	2	2	2	1	2	1	33
		% within CD79a	3.0%	45.5%	18.2%	6.0%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

P=0.02 is statistically and clinically significant (CD79a on mature B cell)

Table (40): TdT in different types and subtypes of ALL

			Type									Total
			Pro-B	C-ALL	Pre-B	B-ALL	early-T	T-internmidiate	T-ALL	Bilineage	Biphenotypic	
0TdT	Negative	No.	0	9	5	2	0	2	1	0	0	19
		% within TdT	0.0%	47.4%	26.4%	10.5%	0.0%	10.5%	5.3%	0.0%	0.0%	100.0%
		% within Type	0.0%	60.0%	83.3%	100.0%	0.0%	100.0%	50.0%	0.0%	0.0%	57.6%
	Positive	No.	1	6	1	0	2	0	1	2	1	14
		% within TdT	7.1%	42.9%	7.1%	0.0%	14.3%	0.0%	7.1%	14.3%	7.1%	100.0%
		% within Type	100.0%	40.0%	16.7%	0.0%	100.0%	0.0%	50.0%	100.0%	100.0%	42.4%
T0.0%otal		No.	1	1	6	2	2	2	2	2	1	33
		% within TdT	3.0%	45.5%	18.2%	6.1%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

P = 0.02 is statistically and clinically significant (TdT is a marker of immaturity)

Table (41): Cytoμ in different types and subtypes of ALL

			Type									
			Pro-B	C-ALL	pre-B	B-ALL	early-T	T-internmidiate	T-ALL	Bilineage	Biphenotypic	Total
Cytμ	Negative	No.	1	15	2	2	2	1	2	2	1	28
		% within Cytμ	3.6%	53.6%	7.1%	7.1%	7.1%	3.6%	7.2%	7.1%	3.6%	100.0%
		% within Type	100.0%	100.0%	33.3%	100.0%	100.0%	50.0%	100.0%	100.0%	100.0%	84.8%
	Positive	No.	0	0	4	0	0	1	0	0	0	5
		% within Cytμ	0.0%	0.0%	80.0%	0.0%	0.0%	20.0%	0.0%	0.0%	0.0%	100.0%
		% within Type	0.0%	0.0%	66.7%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	15.2%
Total		No.	1	15	6	2	2	2	2	2	1	33
		% within Cytμ	3.0%	45.5%	18.2%	6.1%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

P =0.002. 80.0% of cases that had cytoμ+ are pre-B (which is significant)

Table (42):HLA-DR in different types and subtypes of ALL

			Type									
			Pro-B	C-ALL	Pre-B	B-ALL	early-T	T-internmidiate	T-ALL	Bilineage	Biphenotypic	Total
HLA-DR	Negative	No.	0	0	2	2	1	2	1	0	0	8
		% within HLA-DR	0.0%	0.0%	25.0%	25.0%	12.5%	25.0%	12.5%	0.0%	0.0%	100.0%
		% within Type	0.0%	0.0%	33.7%	100.0%	50.0%	100.0%	50.0%	0.0%	0.0%	24.2%
	Positive	No.	1	15	4	0	1	0	1	2	1	25
		% within HLA-DR	4.0%	60.0%	16.0%	0.0%	4.0%	0.0%	4.0%	8.0%	4.0%	100.0%
		% within Type	100.0%	100.0%	66.7%	0.0%	50.0%	0.0%	50.0%	100.0%	100.0%	75.8%
Total		No.	1	15	6	2	2	2	2	2	1	33
		% within HLA-DR	3.0%	45.5%	18.2%	6.1%	6.1%	6.1%	6.0%	6.1%	3.0%	100.0%
		% within Type	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

P = 0.003 statistically and clinically significant. (HLA-DR present on most cases of B-ALL).

Conventional G-banding (karyotyping):

-Table (43): Results of karyotyping.

		Frequency	Percent	Valid Percent
Karyotyping	Failed	3	9.1	9.1
	Both	1	3.0	3.0
	Normal	19	57.6	57.6
	Numerical	6	18.2	18.2
	Structural	4	12.1	12.1
	Total	33	100.0	100.0

Table (44) list of numerical and structural abnormalities

Karyotyping abnormality	Type of the abnormality
46,XY,t (1;13) (P36;P32)	Structural (translocation)
46,XX,t (11; 22) (p23;q11)	Structural (translocation)
46,xx,der (17)	Structural (derivative*)
46,XX,t (11; 22) (p23;q11)	Structural (translocation)
48,XY,+5,+8,der (19),I (7) (q10)	Both (sturctural and numerical)
47,XX,+8	Numerical (hyperdiploidy)
47,XXX	Numerical (hyperdiploidy)
47,XX, + 21	Numerical (hyperdiploidy)
52,XY, +5, +8, + 10, + 14,+21, +21	Numerical (high hyperdiploidy)
45,XY, -20	Numerical (hypodiploidy)
41,XX , - 8, - 13, -16,-19,-21	Numerical (hypodiploidy)

* Derivative chromosomes: abb "der" : any structurally rearranged chromosome generated by an abnormality involving two or more chromosomes.

Table (45): Incidence of numerical abnormalities:

			Frequency	Percent	Valid Percent
Abnormalities		Negative	23	69.7	76.7
		Positive	7	21.2	23.3
	Missing	System	3	9.1	
	Total		33	100.0	

Table (46): Incidence of hyperdiploidy and hypodiploidy

	Frequency	Percent	Valid percent
High Hyperdiploidy	1	3.03	3.03
Hyperdiploidy	4	12.12	12.12
Hypodiploidy	2	6.06	6.06
Other	23	69.69	69.69
Failed	3	3.1	9.1
Total			

This table with the table (45): Show that:

1-Numerical abnormalities are 7 cases, 5 of them are hyperdiploidy i.e 71.43% of numerical abnormalities in childhood ALL are hyperdiploidy while 28.57% are hypodiploidy.

2-High hyperdiploidy represent 20% of hyperdiploid cases (high hyperdiploidy 51-67 chromosomes and hyperdiploidy 47-50 chromosomes).

Table (47): Immunophenotyping and hyperdiploidy of the studied cases

		B-ALL	Mixed	T-ALL	Total
Hyperdiploidy :					
Negative	No.	19	3	6	28
	%within hyperdiploidy	67.85%	10.72%	21.43%	100.0%
	% within in the type	79.17%	100.0%	100.0%	84.84%
Positive	No.	5	0	0	5
	% within hyperdiploidy	100.0%	0.0%	0.0%	100.0%
	% within in the type	20.83	0.0%	0.0%	15.16%
Total	No.	24	3	6	33
	% within hyperdiploidy	72.7%	9.1%	18.2	100.0%
	% within in the type	100.0%	100.0%	100.0%	100.0%

P. value highly significant < 0.001. So hyperdiploidy is most common in B-ALL.

Table (48): Structural abnormalities of studied cases

			Frequency	Percent	Valid Percent
Abnormalities		Negative	25	75.8	83.3
		Positive	5	15.2	16.7
		Total	30	90.9	100.0
	Missing	System	3	9.1	
	Total		33	100.0	

-Flurorescence in situ hybridization :

Table (49): Result of FISH

		Frequency	Percent	Valid percent
	Negative	31	93.9	93.9
	Positive	2	6.1	6.1
	Total	33	100.0	100.0

Two cases had t (8,14) (q24,q32). Both cases by conventional G-band are normal karyotype, so FISH analysis can detect hidden abnormality.

Table (50): FISH rsults confirm cytogenetic abnormality

Karyotyping abnormality	FISH result
52,XY, +5, +8, + 10, + 14,+21, +21	Three orange, three green, with no fusion signals (3o3 G0F)
41,XX , - 8, - 13, -16,-19,-21	One orange, two green with no fusion signals (1o2G0F)
48,XY,+5,+8,der (19),I (7) (q10)	Three orange, two green with no fusion signals (3o2G0F)
47,XX,+8	Three orange, two green with no fusion signals (3o2G0F)

CASE REPORT (I)

A 3 years old male was evaluated as follows:

1-Clinically:

-On examination he had huge hepatosplenomegally, generalized lymphadenopathy and intermittent episodes of fever, with no petichae on his skin.

2-Laboratory:

1-The initial blood count revealed: Haemoglobin 9.8g/dL, TLC $180x10^9$/L, platelets $89x10^9$dL. Peripheral smear had 46% of blasts following L3 FAB morphology.

2-Chemistry:

-AST, 74.5U/L (N: 15-37d/L), ALT 27.8U/L (N: 30-65U/L) done as base line before starting chemotherapy

-Lactate dehydrogenase (LDH) was 6393 IU/L (N: 240-480IU/L) and urinc acid 4.9mg/dL (N: 2.6- 7.2mg/dL).

3-Bone Marrow examination revealed:

-Hypercellularity, trilineage dysplasia (with reduced megakaryocytes, diminished myeloid and erythrocyte production and blasts.

4-Immunophenotyping:

1-The blast were negative for CD34, TdT (markers of early precursors), MPO, CD13 (myeloid markers), CD3, CD5, CD7 (T-markers)

2-The basts were positive for expression of :

CD10 (81.53%), CD19 (81.53), CD20 (47.74%), CD22 (85.15%), CD79a (77.01%), HLA-DR (76.20%)

5-Karyotyping result using conventional G-band revealed normal male karyotyping (46,XY).

6-The study by using fluorescence in situ hybridization technique with t (8;14) (q24; q32) probe revealed positive result for this structural abnormality.

CASE REPORT (II)

A 6 years old male was evaluated as follows :

1-Clinically:

-On examination he had mild hepatosplenonegally, generalized lymphademopathy, prolonged fever and purpuric eruption.

2-Laboratory:

1-The initial blood counts revealed:

Hemoglobin 6.8g/dL, TLC 11.1 x 10^9/L and platelets 29 x 10^9/L. Peripheral smear had 76% of blasts following L3 FAB classification.

2-Chemistry:

-AST, 287 U/L (N: 15-37U/L) and ALT, 315 U/L (N: 30-65 U/L). Both done as a base line before starting chemotherapy.

-Lactate dehydrogenase (LDH): 530 IU/L (N: 240-480IU/L) and uric acid 6.1mg/dL (N: 2.6-7.2mg/dL).

3-Bone marrow aspiration revealed:

Normocellular, trilineage dysplasia (with reduced megakaryocytes, diminished myeloid and erythroid production) and 83% blasts.

4-Immunophenotyping by FCM:

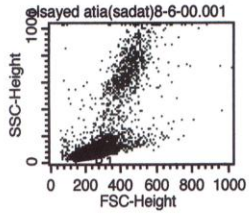
-The blasts were negative for CD34, TdT (markers of early precursors) MPO, CD13 (myeloid markers) and CD3, CD5, CD7 (T-cell markers).

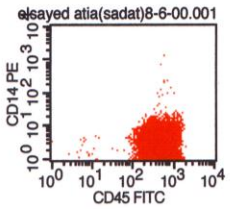
-The blasts were positive for expression of:

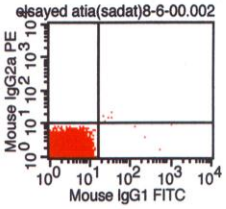
-HLA-DR (68.19%), CD19 (79.18%), CD20 (74.68%), CD22 (85.08%) and CD10 (79.18%).

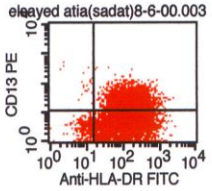
5-Karyotyping result using conventional G-band revealed: normal male karyotyping (46;XY).

6-The study using fluorescence in situ hybridization technique, with t (8,14) (q24,q32) probe revealed: positive result for this structural abnormality.



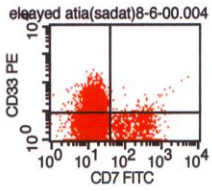






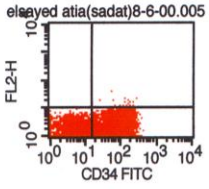
Patient ID: elsayed atia(sadat)8-6-0
Tube: HLAdr/cd13

Quad	% Gated	% Total
UL	0.30	0.24
UR	42.75	34.07
LL	3.88	3.09
LR	53.07	42.29



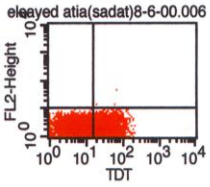
Patient ID: elsayed atia(sadat)8-6-0
Tube: cd7/cd33

Quad	% Gated	% Total
UL	24.06	20.10
UR	0.93	0.78
LL	66.24	55.33
LR	8.76	7.32



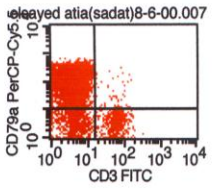
Patient ID: elsayed atia(sadat)8-6-(
Tube: cd34

Quad	% Gated	% Total
UL	0.00	0.00
UR	0.31	0.26
LL	19.51	16.59
LR	80.18	68.18



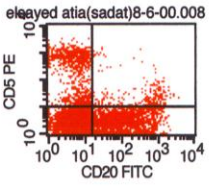
Patient ID: elsayed atia(sadat)8-6-(
Tube: TDT

Quad	% Gated	% Total
UL	0.00	0.00
UR	0.05	0.04
LL	64.38	50.13
LR	35.57	27.70



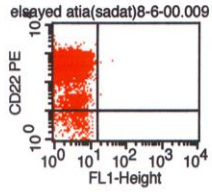
Patient ID: elsayed atia(sadat)8-6-(
Tube: CD3,MPO,CD79a

Quad	% Gated	% Total
UL	82.45	62.49
UR	0.90	0.68
LL	9.61	7.28
LR	7.05	5.34



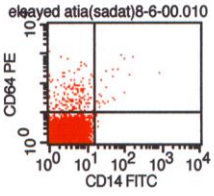
Patient ID: elsayed atia(sadat)8-6-0
Tube: cd20/cd5

Quad	% Gated	% Total
UL	10.86	9.26
UR	2.99	2.55
LL	63.55	54.17
LR	22.60	19.26



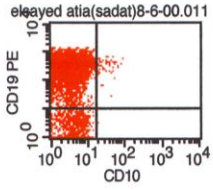
Patient ID: elsayed atia(sadat)8-6-0
Tube: cd22/cd20

Quad	% Gated	% Total
UL	94.79	79.91
UR	0.04	0.03
LL	5.17	4.36
LR	0.00	0.00



Patient ID: elsayed atia(sadat)8-6-0
Tube: cd14/cd64

Quad	% Gated	% Total
UL	1.87	1.63
UR	0.30	0.26
LL	97.78	85.36
LR	0.06	0.05

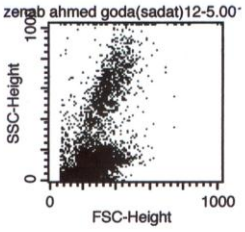


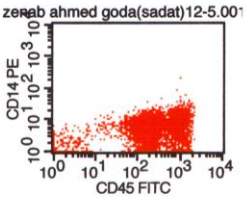
Patient ID: elsayed atia(sadat)8-6-00
Tube: cd10,cd19

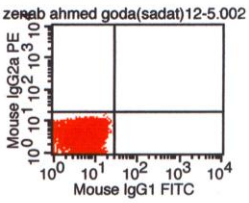
Quad	% Gated	% Total
UL	90.81	77.43
UR	0.70	0.60
LL	8.47	7.22
LR	0.02	0.02

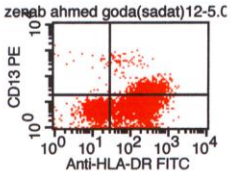
Flow sheet (1):

Immunophenotyping of peripheral blood revealed:
positive: CD13, HLA-DR, CD7, CD34, TDT, CD79a, CD20, CD22, CD19
A picture of pro- B-ALL with abberant expression of CD13.



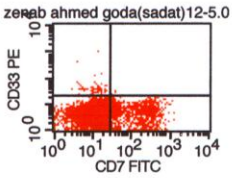






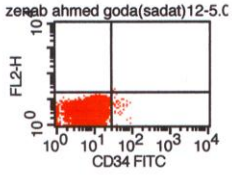
Patient ID: zenab ahmed go
Tube: HLAdr/cd13

Quad	% Gated	% Total
UL	0.46	0.25
UR	18.38	10.05
LL	23.51	12.86
LR	57.65	31.53



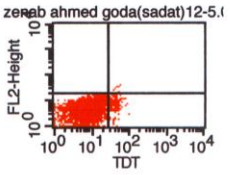
Patient ID: zenab ahmed gc
Tube: cd7/cd33

Quad	% Gated	% Total
UL	0.96	0.69
UR	0.07	0.05
LL	84.16	60.67
LR	14.81	10.68



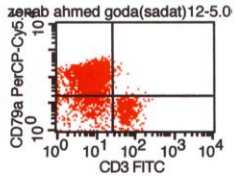
Patient ID: zenab ahmed go
Tube: cd34

Quad	% Gated	% Total
UL	0.01	0.01
UR	0.04	0.03
LL	99.23	67.36
LR	0.71	0.48



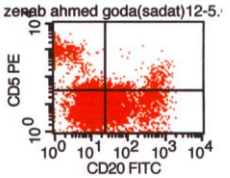
Patient ID: zenab ahmed go
Tube: TDT

Quad	% Gated	% Total
UL	0.04	0.02
UR	0.12	0.06
LL	96.39	49.91
LR	3.46	1.79



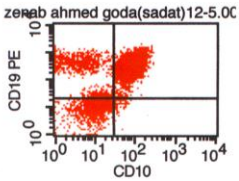
Patient ID: zenab ahmed gc
Tube: CD3,MPO,CD79a

Quad	% Gated	% Total
UL	79.35	40.04
UR	0.52	0.26
LL	10.70	5.40
LR	9.43	4.76



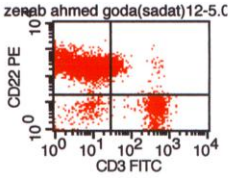
Patient ID: zenab ahmed gc
Tube: cd20/cd5

Quad	% Gated	% Total
UL	16.45	11.38
UR	5.98	4.14
LL	50.10	34.66
LR	27.46	19.00



Patient ID: zenab ahmed gc
Tube: cd10,cd19

Quad	% Gated	% Total
UL	14.40	9.58
UR	66.99	44.58
LL	17.02	11.33
LR	1.59	1.06

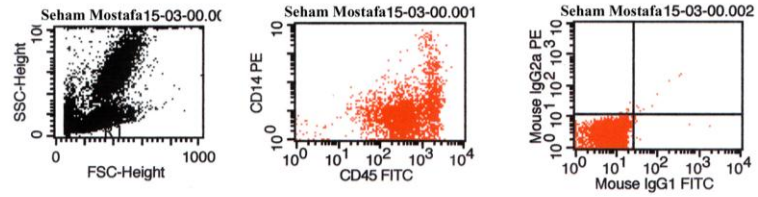


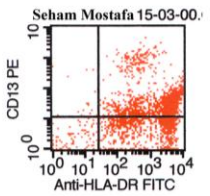
Patient ID: zenab ahmed goc
Tube: CD3,CD22

Quad	% Gated	% Total
UL	79.04	55.45
UR	7.08	4.97
LL	3.31	2.32
LR	10.56	7.41

Flow sheet (2):

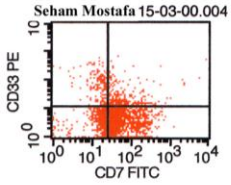
Immunophenotyping of BM sample revealed:
positive: HLA-DR, CD79a,CD20, CD19, CD10, CD22
Acase of pre- B-ALL





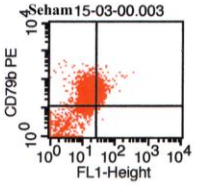
Patient ID: Seham Mostafa
Tube: HLAdr/cd13

Quad	% Gated	% Total
UL	0.66	0.17
UR	64.51	16.65
LL	3.25	0.84
LR	31.58	8.15



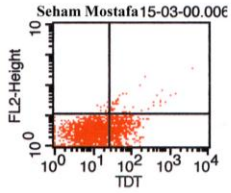
Patient ID: Seham Mostafa
Tube: cd7/cd33

Quad	% Gated	% Total
UL	5.13	1.83
UR	9.12	3.25
LL	21.46	7.65
LR	64.28	22.91



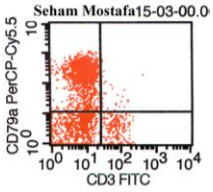
Patient ID:Seham16-03-00
Tube: CD79b

Quad	% Gated	% Total
UL	58.60	15.02
UR	17.25	4.42
LL	23.76	6.09
LR	0.39	0.10



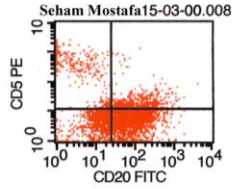
Patient ID: Seham Mostafa
Tube: TDT

Quad	% Gated	% Total
UL	0.38	0.08
UR	1.97	0.42
LL	73.45	15.63
LR	24.20	5.15



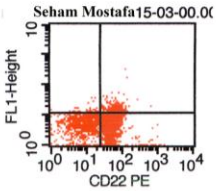
Patient ID: Seham Mostafa
Tube: CD3,MPO,CD79a

Quad	% Gated	% Total
UL	62.05	15.16
UR	1.35	0.33
LL	28.00	6.84
LR	8.60	2.10



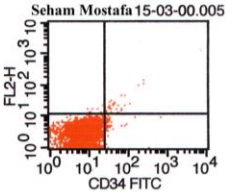
Patient ID: Seham Mostafa
Tube: cd20/cd5

Quad	% Gated	% Total
UL	10.35	3.76
UR	14.45	5.25
LL	23.49	8.53
LR	51.71	18.78



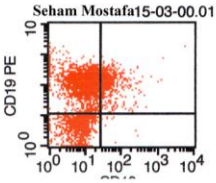
Patient ID: Seham Mostafa
Tube: cd22/cd20

Quad	% Gated	% Total
UL	1.36	0.48
UR	9.78	3.44
LL	23.26	8.18
LR	65.60	23.07



Patient ID: Seham Mostafa
Tube: cd34

Quad	% Gated	% Total
UL	0.28	0.12
UR	0.79	0.34
LL	97.92	42.40
LR	1.02	0.44

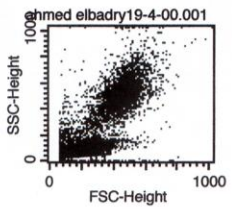


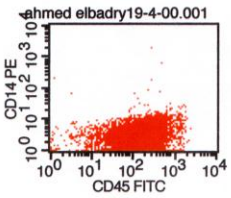
Patient ID: Seham Mostafa
Tube: cd10,cd19

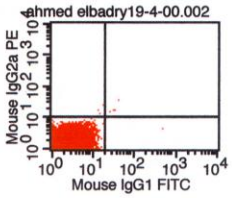
Quad	% Gated	% Total
UL	64.64	27.11
UR	14.95	6.27
LL	20.15	8.45
LR	0.26	0.11

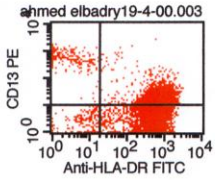
Flow sheet (3):

Immunophenotyping of BM sample revealed : positive ; CD79a, CD20, CD22, CD19, CD13, TDT, HLA-DR, CD79b
a picture of pre B -ALL with aberrant expression CD13



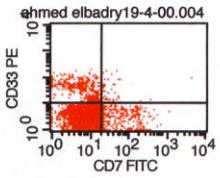






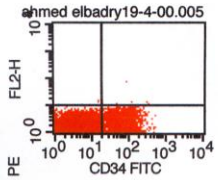
Patient ID: ahmed elbadry19
Tube: HLAdr/cd13

Quad	% Gated	% Total
UL	5.50	2.90
UR	33.24	17.53
LL	3.38	1.78
LR	57.89	30.53



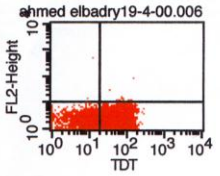
Patient ID: ahmed elbadry19
Tube: cd7/cd33

Quad	% Gated	% Total
UL	6.32	3.81
UR	0.81	0.49
LL	86.85	52.32
LR	6.01	3.62



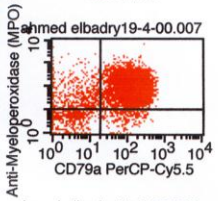
Patient ID: ahmed elbadry19
Tube: cd34

Quad	% Gated	% Total
UL	0.03	0.02
UR	0.08	0.05
LL	66.28	43.21
LR	33.61	21.91



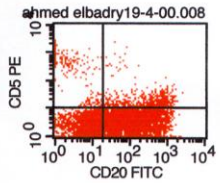
Patient ID: ahmed elbadry19
Tube: TDT

Quad	% Gated	% Total
UL	0.03	0.02
UR	0.23	0.14
LL	29.14	17.77
LR	70.60	43.06



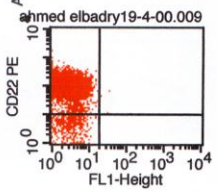
Patient ID: ahmed elbadry19
Tube: CD3,MPO,CD79a

Quad	% Gated	% Total
UL	8.67	4.89
UR	79.93	45.09
LL	6.95	3.92
LR	4.45	2.51



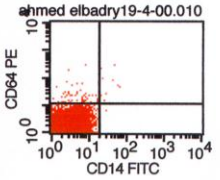
Patient ID: ahmed elbadry1
Tube: cd20/cd5

Quad	% Gated	% Total
UL	4.07	2.38
UR	9.72	5.68
LL	32.30	18.88
LR	53.91	31.51



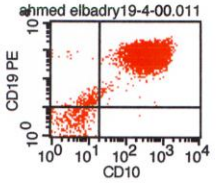
Patient ID: ahmed elbadry1
Tube: cd22/cd20

Quad	% Gated	% Total
UL	93.17	58.42
UR	0.05	0.03
LL	6.78	4.25
LR	0.00	0.00



Patient ID: ahmed elbadry19-
Tube: cd14/cd64

Quad	% Gated	% Total
UL	1.07	0.66
UR	0.15	0.09
LL	98.77	61.11
LR	0.02	0.01

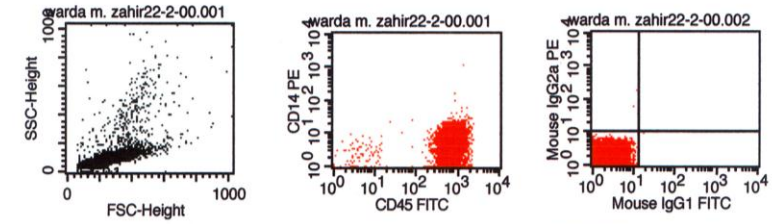


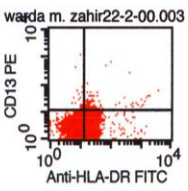
Patient ID: ahmed elbadry19-
Tube: cd10,cd19

Quad	% Gated	% Total
UL	2.57	1.61
UR	92.36	57.80
LL	5.05	3.16
LR	0.02	0.01

Flow sheet (4):

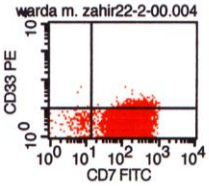
Immunophenotyping of BM sample revealed:
positive:CD13, MPO &
HLA-DR, CD34, TDT, CD79a, CD22, CD10,
CD19, CD20
Negative T- lymphatic markers
a picture of biphenotypic leukemia





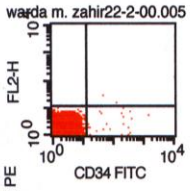
Patient ID: warda m. zahir
Tube: HLAdr/cd13

Quad	% Gated	% Total
UL	0.36	0.31
UR	1.36	1.16
LL	47.12	40.28
LR	51.16	43.73



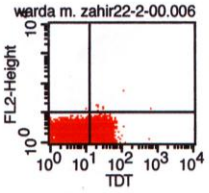
Patient ID: warda m. zahir
Tube: cd7/cd33

Quad	% Gated	% Total
UL	0.05	0.04
UR	5.96	5.03
LL	2.28	1.92
LR	91.71	77.37



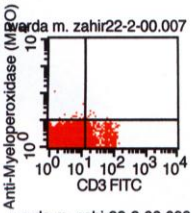
Patient ID: warda m. zahir
Tube: cd34

Quad	% Gated	% Total
UL	0.00	0.00
UR	0.02	0.02
LL	99.66	85.81
LR	0.31	0.27



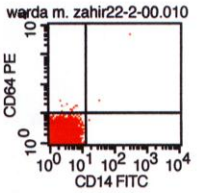
Patient ID: warda m. zahir
Tube: TDT

Quad	% Gated	% Total
UL	0.02	0.02
UR	0.11	0.09
LL	55.11	47.12
LR	44.76	38.27



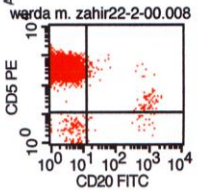
Patient ID: warda m. zahir
Tube: CD3,MPO,CD79a

Quad	% Gated	% Total
UL	0.18	0.15
UR	0.09	0.08
LL	83.80	71.54
LR	15.93	13.60



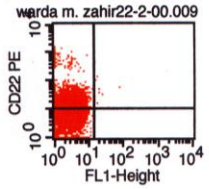
Patient ID: warda m. zahir
Tube: cd14/cd64

Quad	% Gated	% Total
UL	0.12	0.10
UR	0.03	0.03
LL	99.84	86.80
LR	0.01	0.01



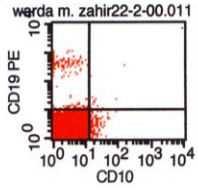
Patient ID: warda m. zahir
Tube: cd20/cd5

Quad	% Gated	% Total
UL	97.21	81.59
UR	1.29	1.08
LL	1.22	1.02
LR	0.29	0.24



Patient ID: warda m. zahir
Tube: cd22/cd20

Quad	% Gated	% Total
UL	52.09	44.72
UR	0.09	0.08
LL	47.82	41.05
LR	0.00	0.00

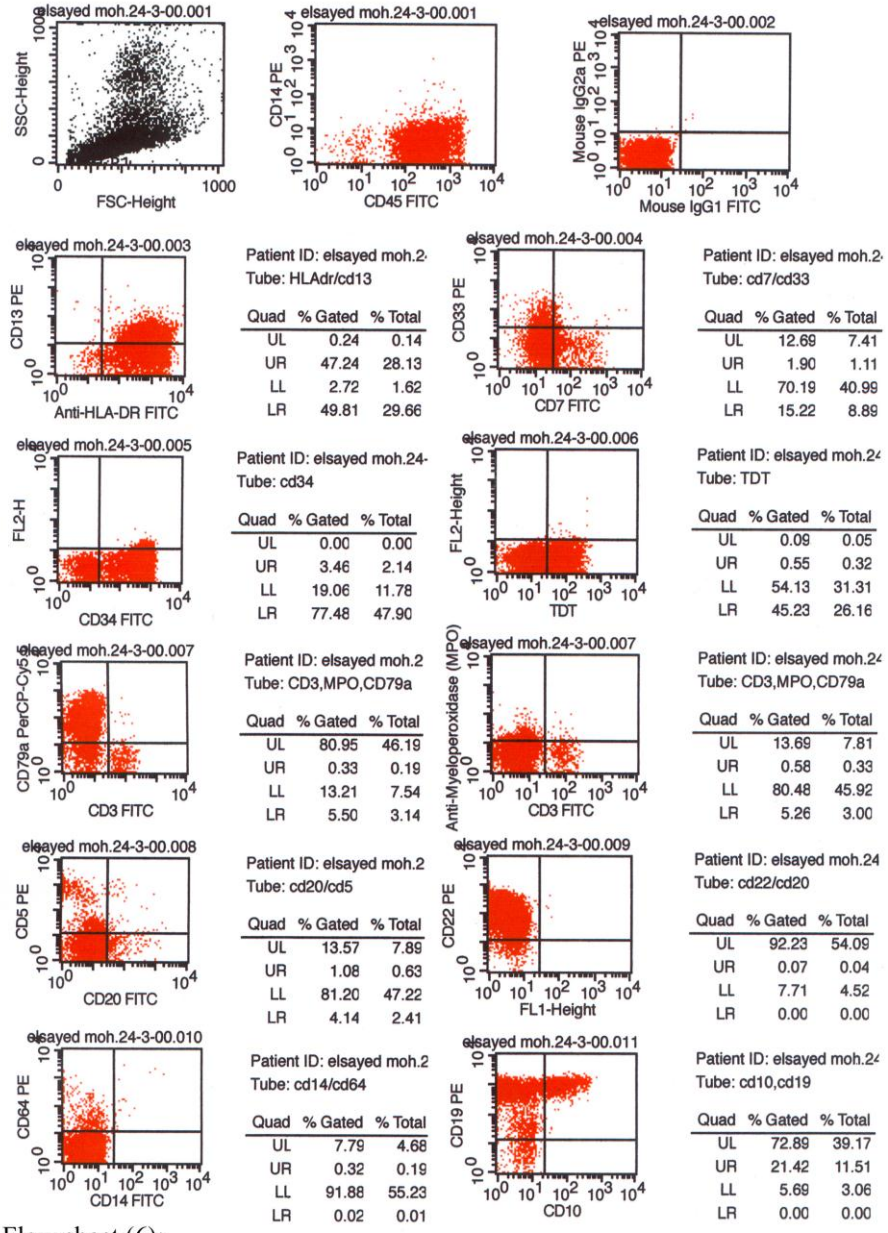


Patient ID: warda m. zahir
Tube: cd10,cd19

Quad	% Gated	% Total
UL	1.85	1.55
UR	0.14	0.12
LL	96.76	81.25
LR	1.25	1.05

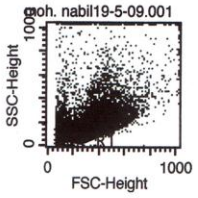
Flow sheet (5):

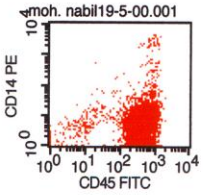
Immunophenotyping of P.B. sample revealed:
Positive: CD7,CD5,TDT,HLA-DR , CD22
Negative: myeloid markers
Picture of T-ALL with aberrant expression, CD22

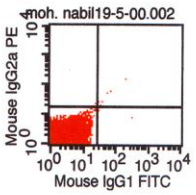


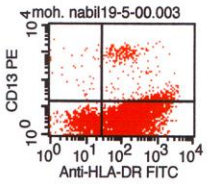
Flow sheet (6):

Immunophenotyping of B.M. sample revealed:
Positive: HLA-DR,CD13,CD34,TDT,CD79a,CD22,CD19,CD10
Picture of C-ALL with aberrant expression CD13.



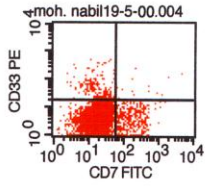






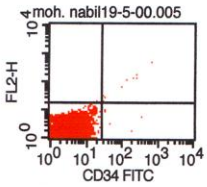
Patient ID: moh. nabil19-5-(
Tube: HLAdr/cd13

Quad	% Gated	% Total
UL	0.67	0.38
UR	8.16	4.65
LL	14.97	8.53
LR	76.20	43.42



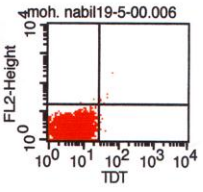
Patient ID: moh. nabil19-5
Tube: cd7/cd33

Quad	% Gated	% Total
UL	3.65	2.20
UR	0.25	0.15
LL	90.06	54.30
LR	6.04	3.64



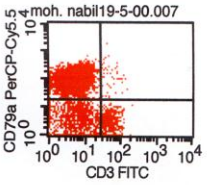
Patient ID: moh. nabil19-5-(
Tube: cd34

Quad	% Gated	% Total
UL	0.02	0.01
UR	0.14	0.09
LL	99.76	65.58
LR	0.09	0.06



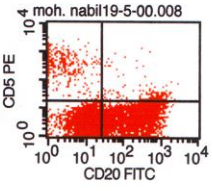
Patient ID: moh. nabil19-5-0
Tube: TDT

Quad	% Gated	% Total
UL	0.05	0.03
UR	0.10	0.06
LL	99.71	62.48
LR	0.14	0.09



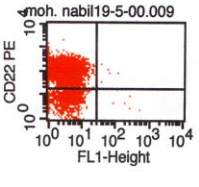
Patient ID: moh. nabil19-5-
Tube: CD3,MPO,CD79a

Quad	% Gated	% Total
UL	77.01	48.50
UR	0.76	0.48
LL	15.50	9.76
LR	6.73	4.24



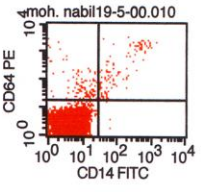
Patient ID: moh. nabil19-5-0
Tube: cd20/cd5

Quad	% Gated	% Total
UL	7.61	4.85
UR	3.63	2.31
LL	41.02	26.13
LR	47.74	30.41



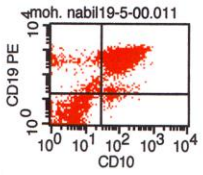
Patient ID: moh. nabil19-5-
Tube: cd22/cd20

Quad	% Gated	% Total
UL	85.15	51.20
UR	0.08	0.05
LL	14.67	8.82
LR	0.10	0.06



Patient ID: moh. nabil19-5-
Tube: cd14/cd64

Quad	% Gated	% Total
UL	1.69	1.11
UR	1.78	1.17
LL	96.44	63.48
LR	0.09	0.06

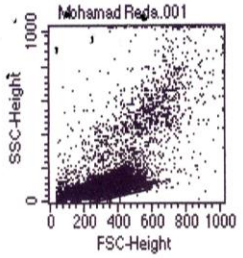


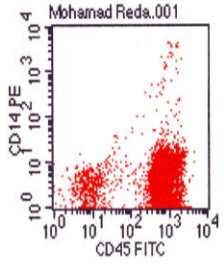
Patient ID: moh. nabil19-5-
Tube: cd10,cd19

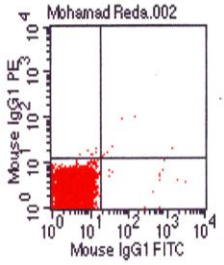
Quad	% Gated	% Total
UL	5.34	3.52
UR	81.53	53.75
LL	11.48	7.57
LR	1.65	1.09

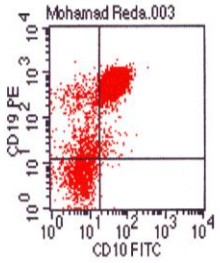
Flow sheet (7):

Immunophenotyping of B.M. sample revealed:
Positivve markers:CD20, CD22, CD79a,CD10, CD19 &HLA-DR.
Negative :Myeloid markers &TDT.
Picture suggestive of B-ALL.



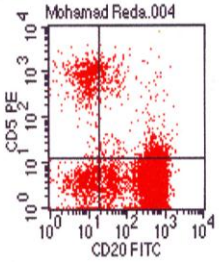






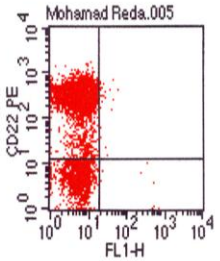
Patient ID: Mohamad Reda
Tube: CD10/CD19

Quad	% Gated	% Total
UL	8.88	6.80
UR	79.18	60.61
LL	11.78	9.02
LR	0.16	0.12



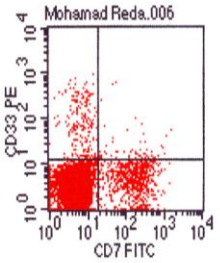
Patient ID: Mohamad Reda
Tube: CD20/CD5

Quad	% Gated	% Total
UL	6.68	5.09
UR	10.57	8.05
LL	8.06	6.14
LR	74.68	56.88



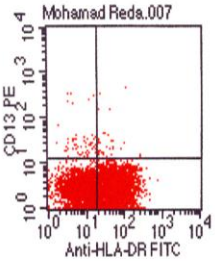
Patient ID: Mohamad Reda
Tube: CD22

Quad	% Gated	% Total
UL	85.08	65.87
UR	0.39	0.30
LL	14.39	11.14
LR	0.14	0.11



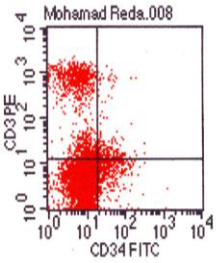
Patient ID: Mohamad Reda
Tube: CD7/CD33

Quad	% Gated	% Total
UL	3.37	2.29
UR	1.06	0.72
LL	84.71	57.55
LR	10.86	7.38



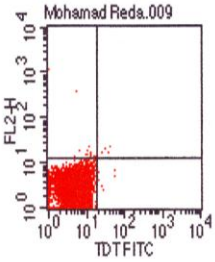
Patient ID: Mohamad Reda
Tube: HLA-DR/CD13

Quad	% Gated	% Total
UL	0.85	0.65
UR	0.46	0.35
LL	30.50	23.26
LR	68.19	52.01



Patient ID: Mohamad Reda
Tube: CD34/CD3

Quad	% Gated	% Total
UL	13.55	9.83
UR	2.47	1.79
LL	78.53	56.95
LR	5.45	3.95



Patient ID: Mohamad Reda
Tube: TDT

Quad	% Gated	% Total
UL	0.20	0.15
UR	0.07	0.05
LL	99.62	74.05
LR	0.11	0.08

Flow sheet (8):

Immunophenotyping of B.M. sample revealed:
Positivve markers:CD20, CD22,CD10,
CD19 &HLA-DR.
Negative :Myeloid markers &TDT.
Picture suggestive of B-ALL.

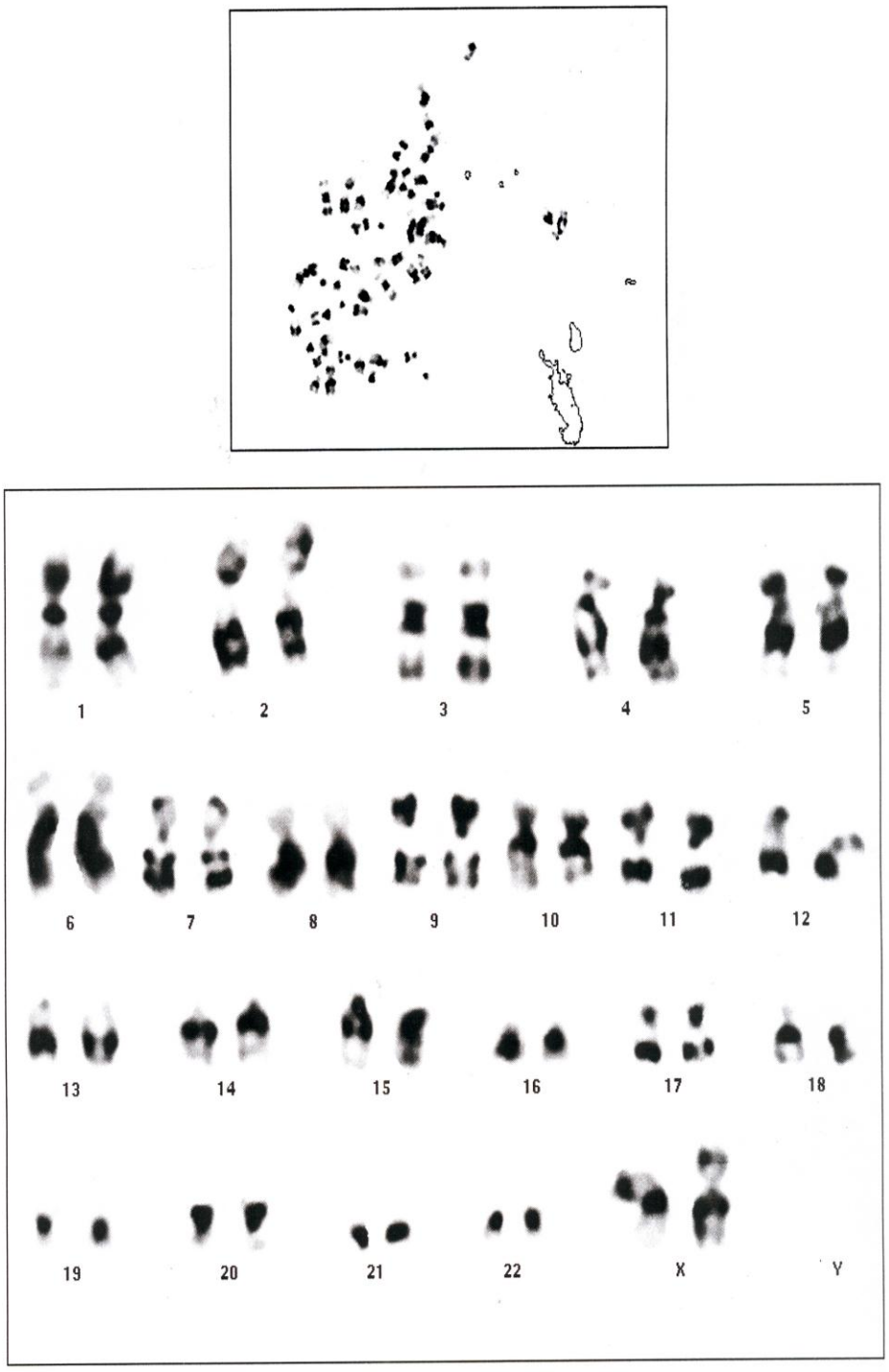


Figure (23) : 46,XY

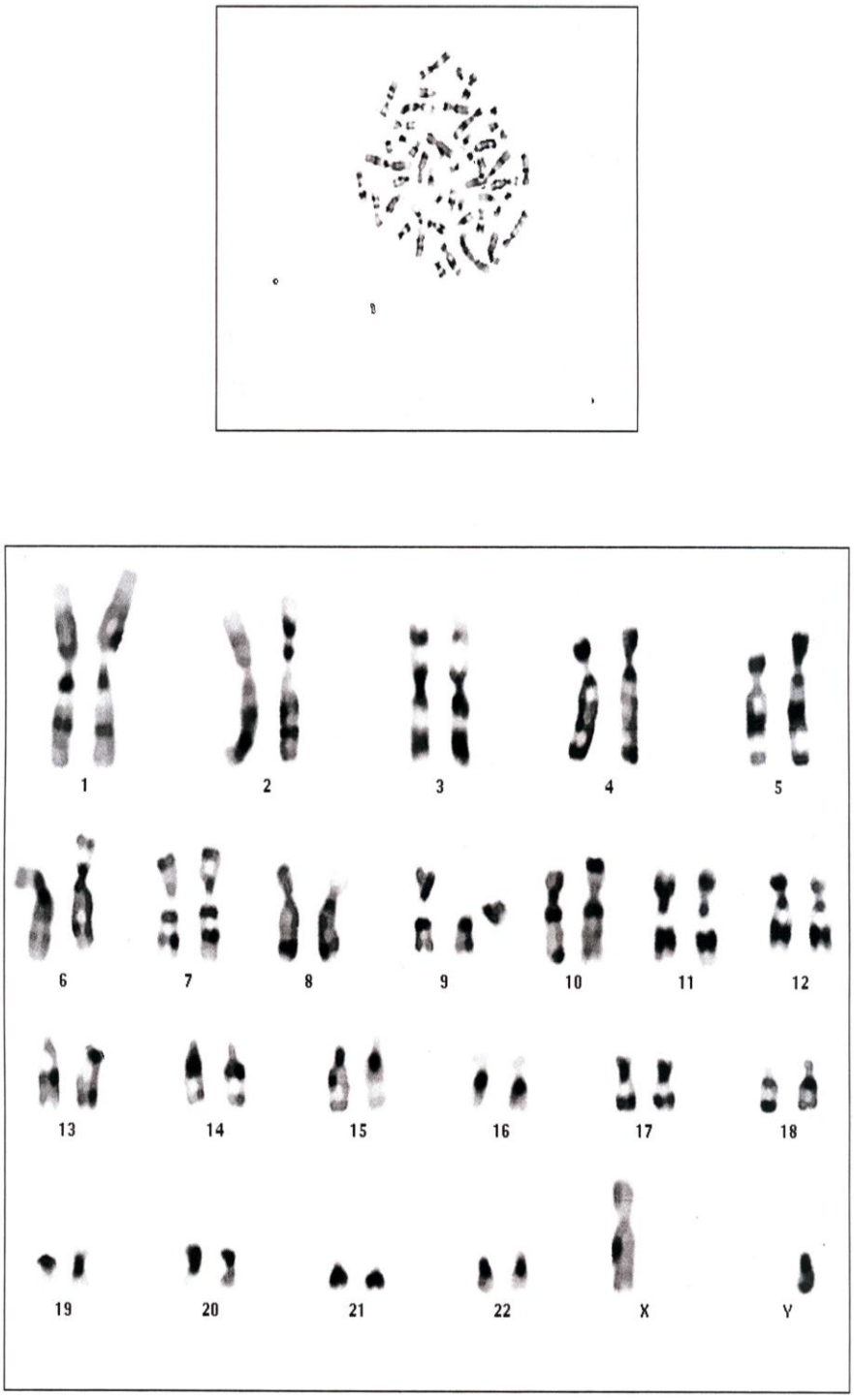


Figure (24) : Shows : 46, XX.

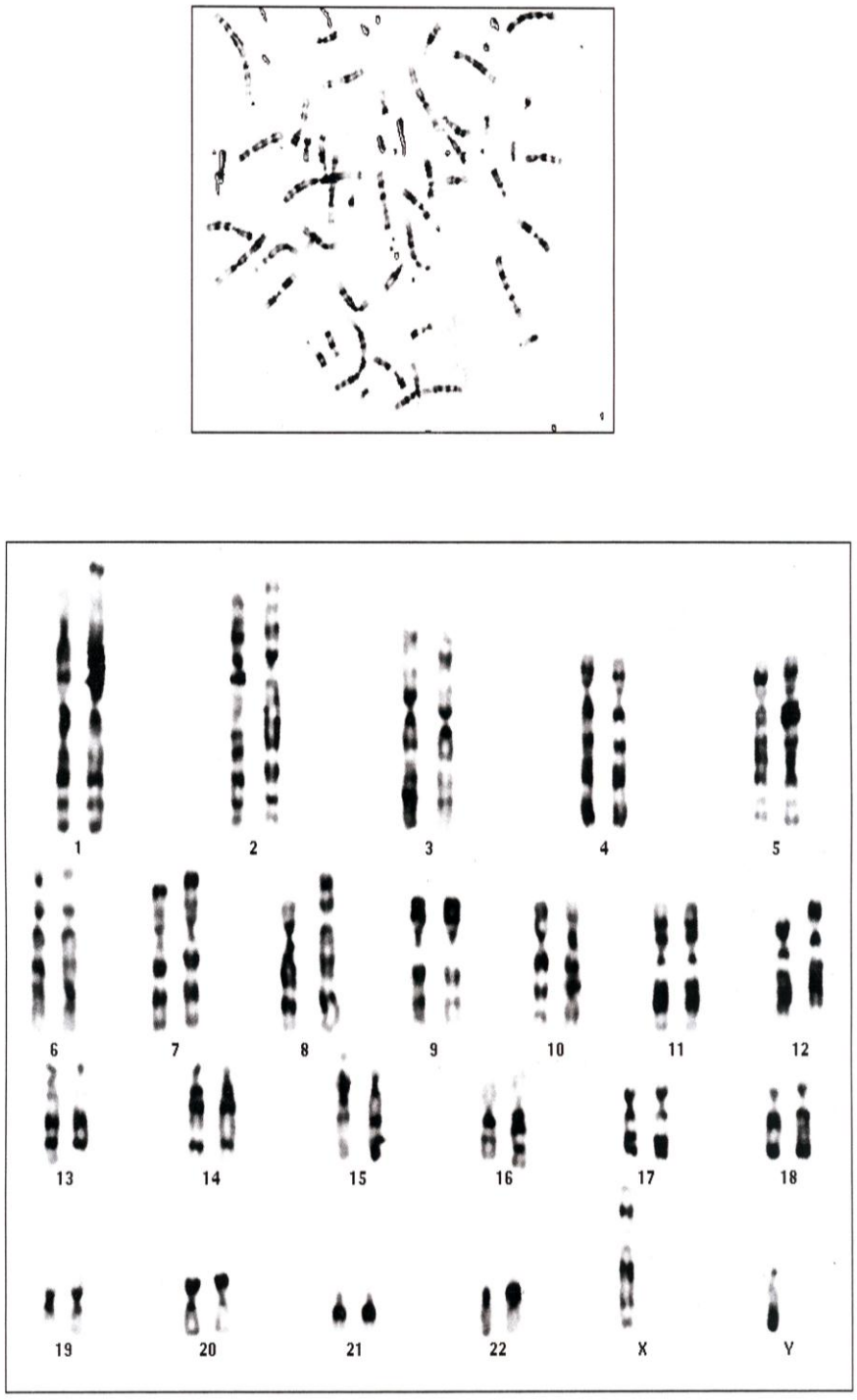


Figure (25) : Shows : 46, XY, t(1;13) (P36;P32)

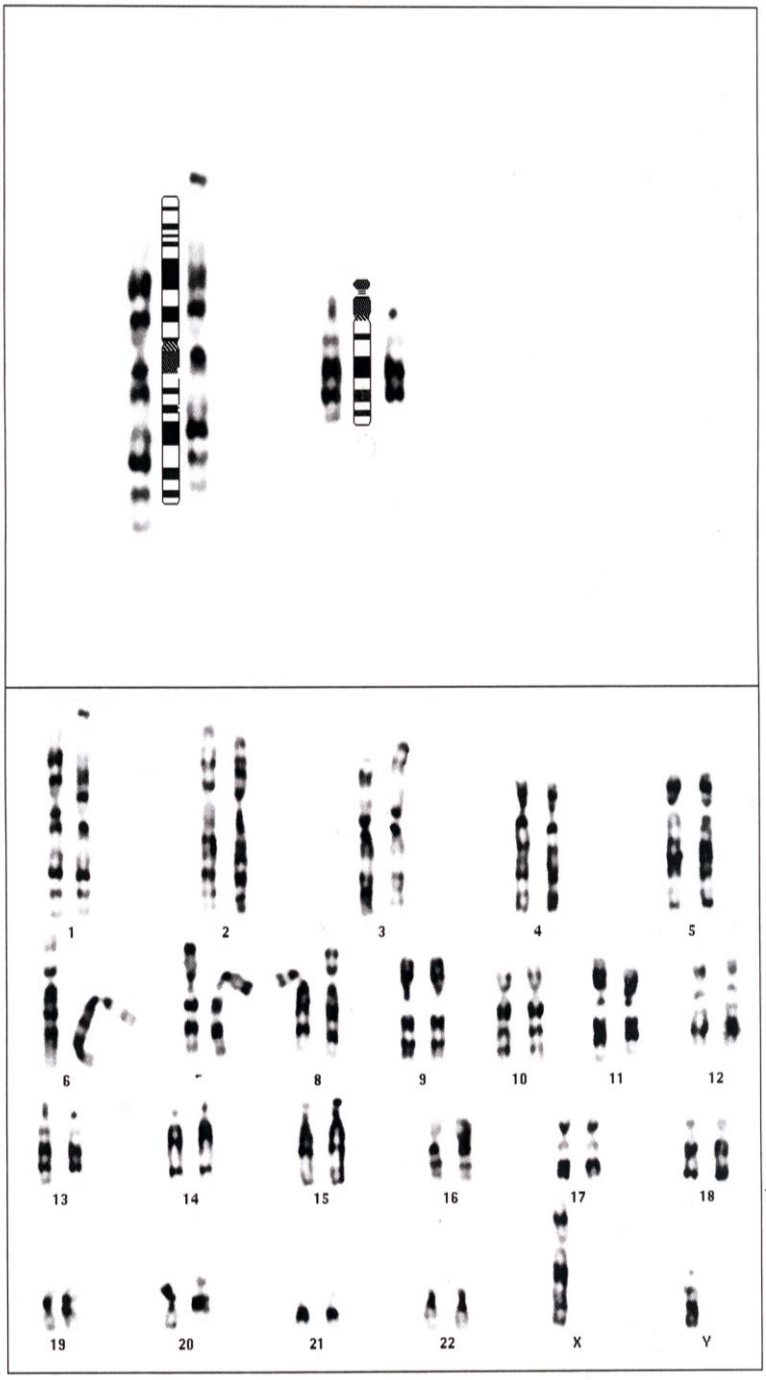


Figure (26) : Shows : 46, XY, t(1;13) (p36;P32)

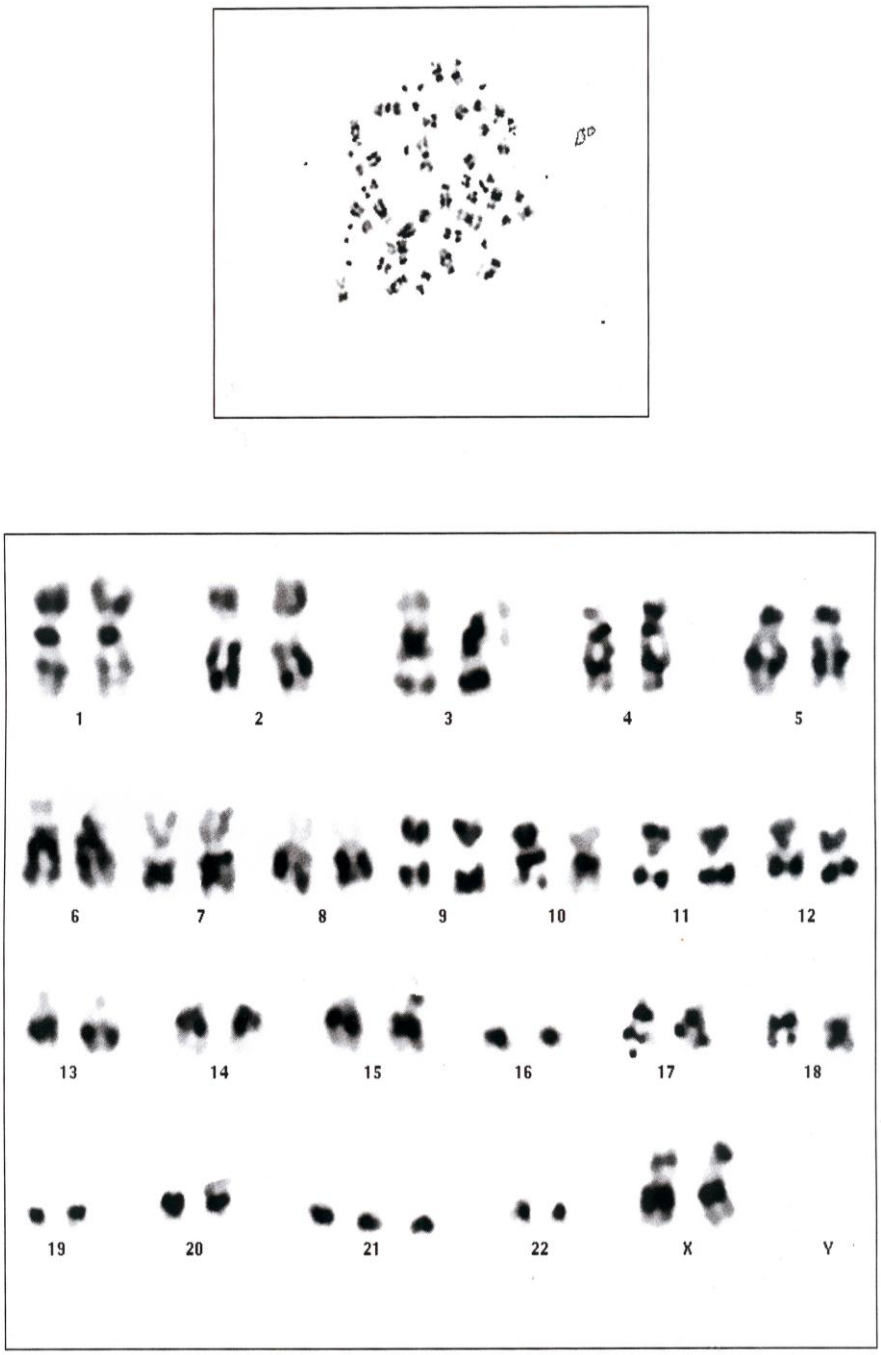


Figure (27) : Shows : 47, XX, +21

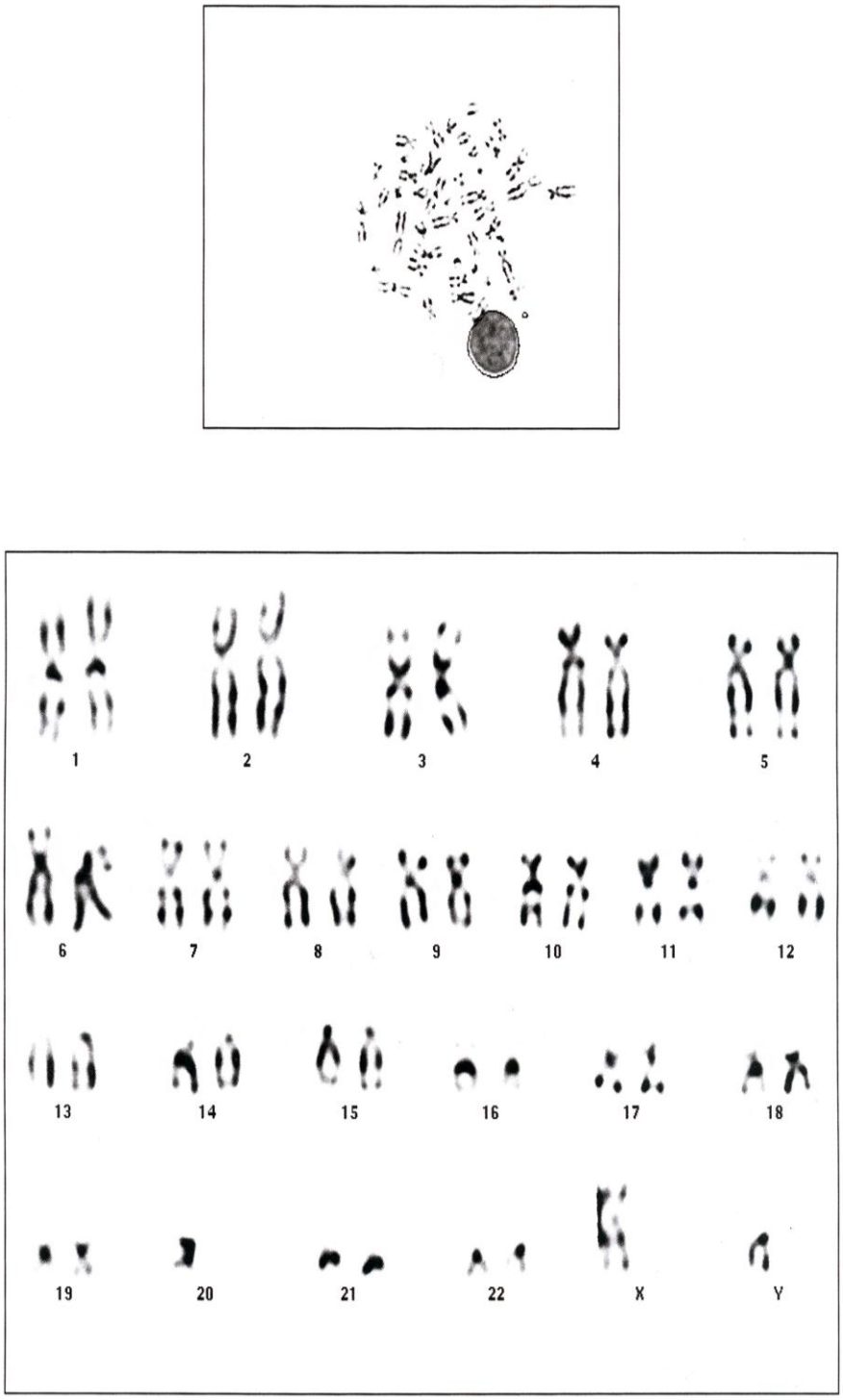


Figure (28) : Shows : 45, XY, -20

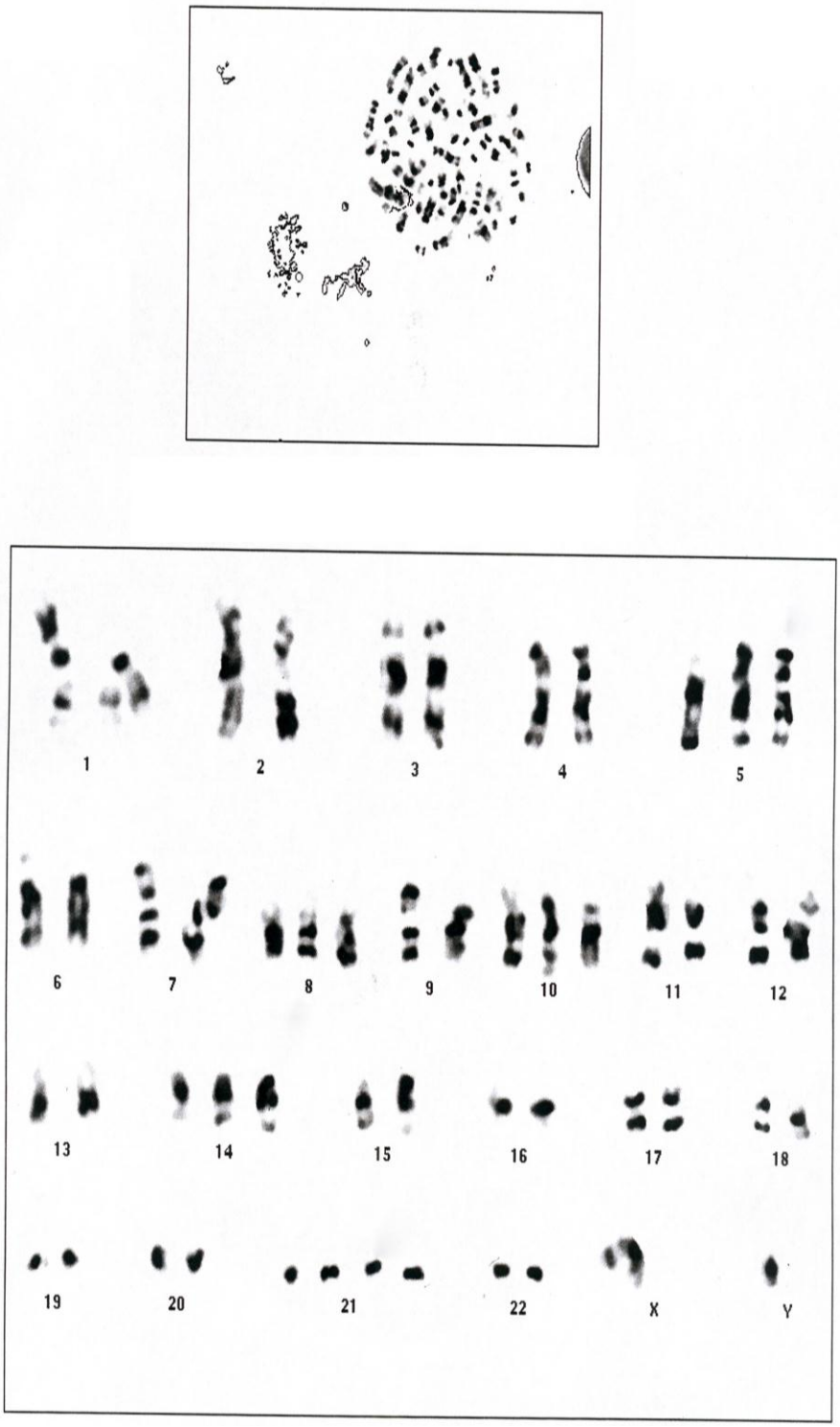


Figure (29) : Shows; 52,XY,+5,+8,+10,+14,+21,+21

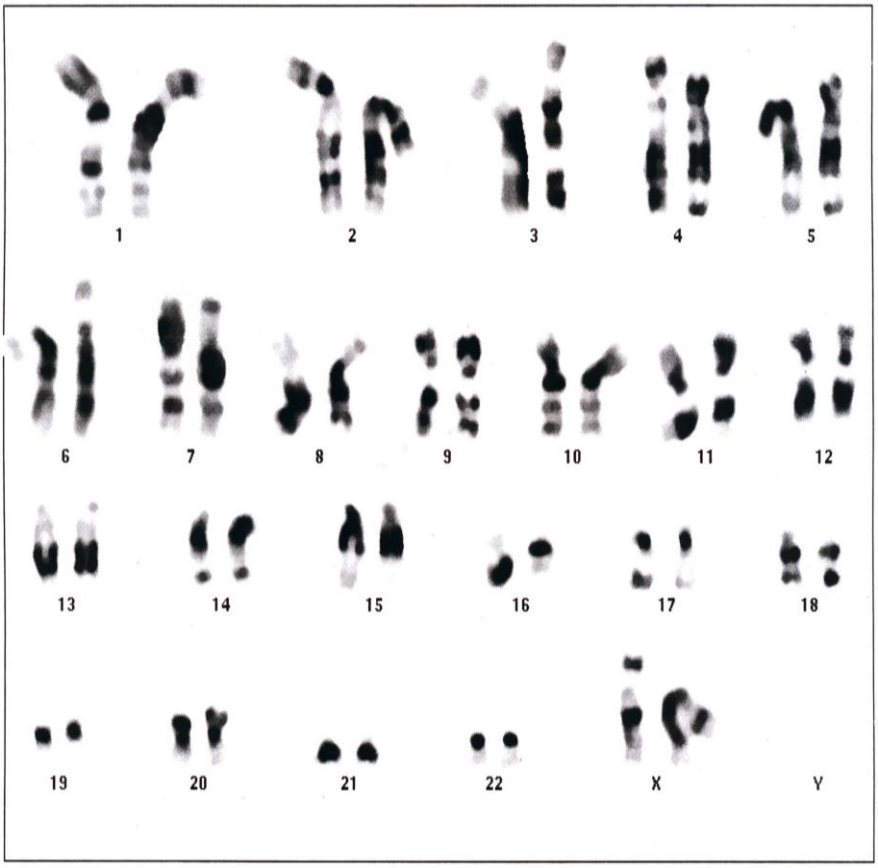


Figure (30) : Shows: 46,XX,der (17)

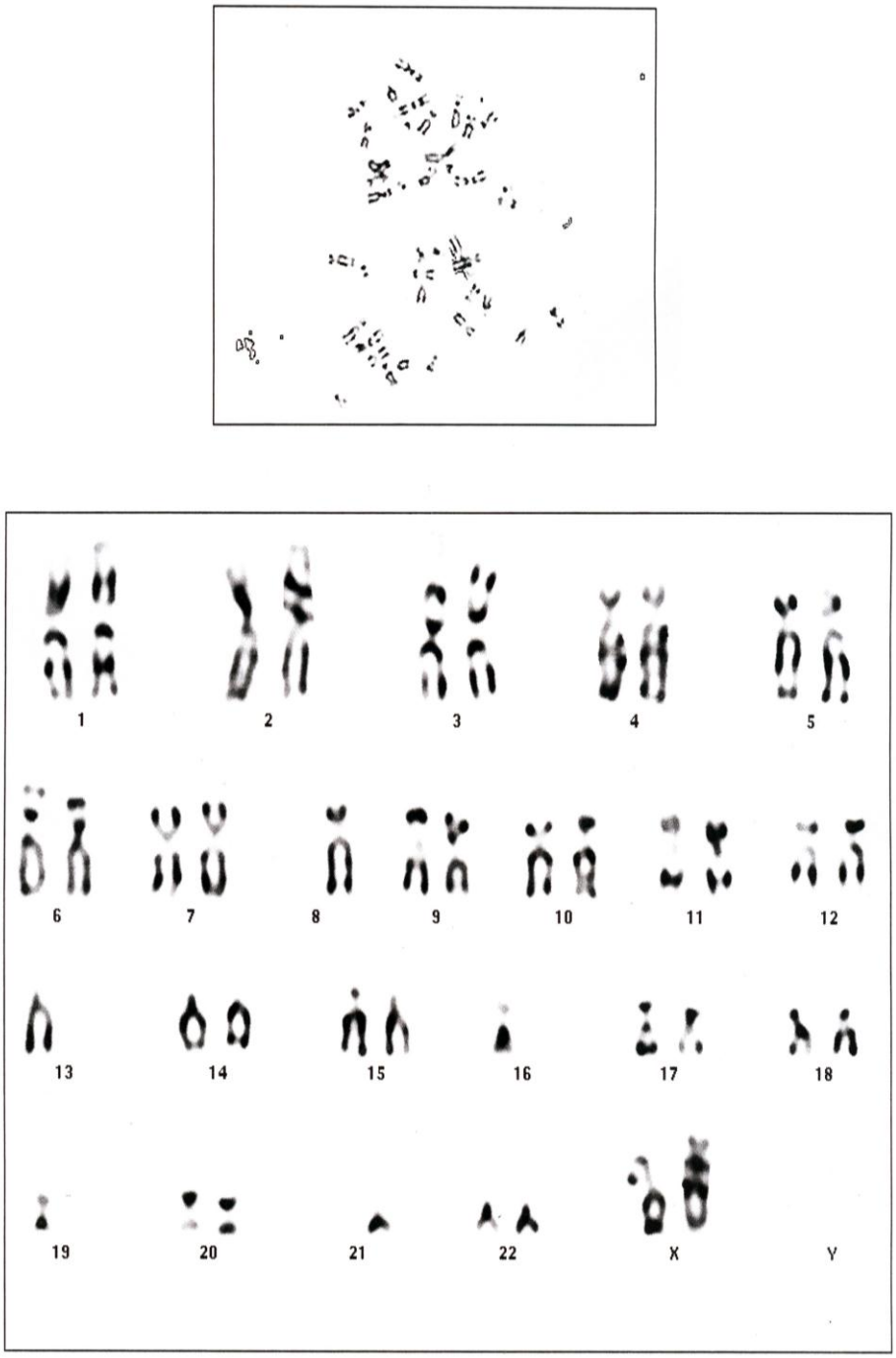


Figure (31) : Shows: 41,XX,-8,-13,-16,-19,-21

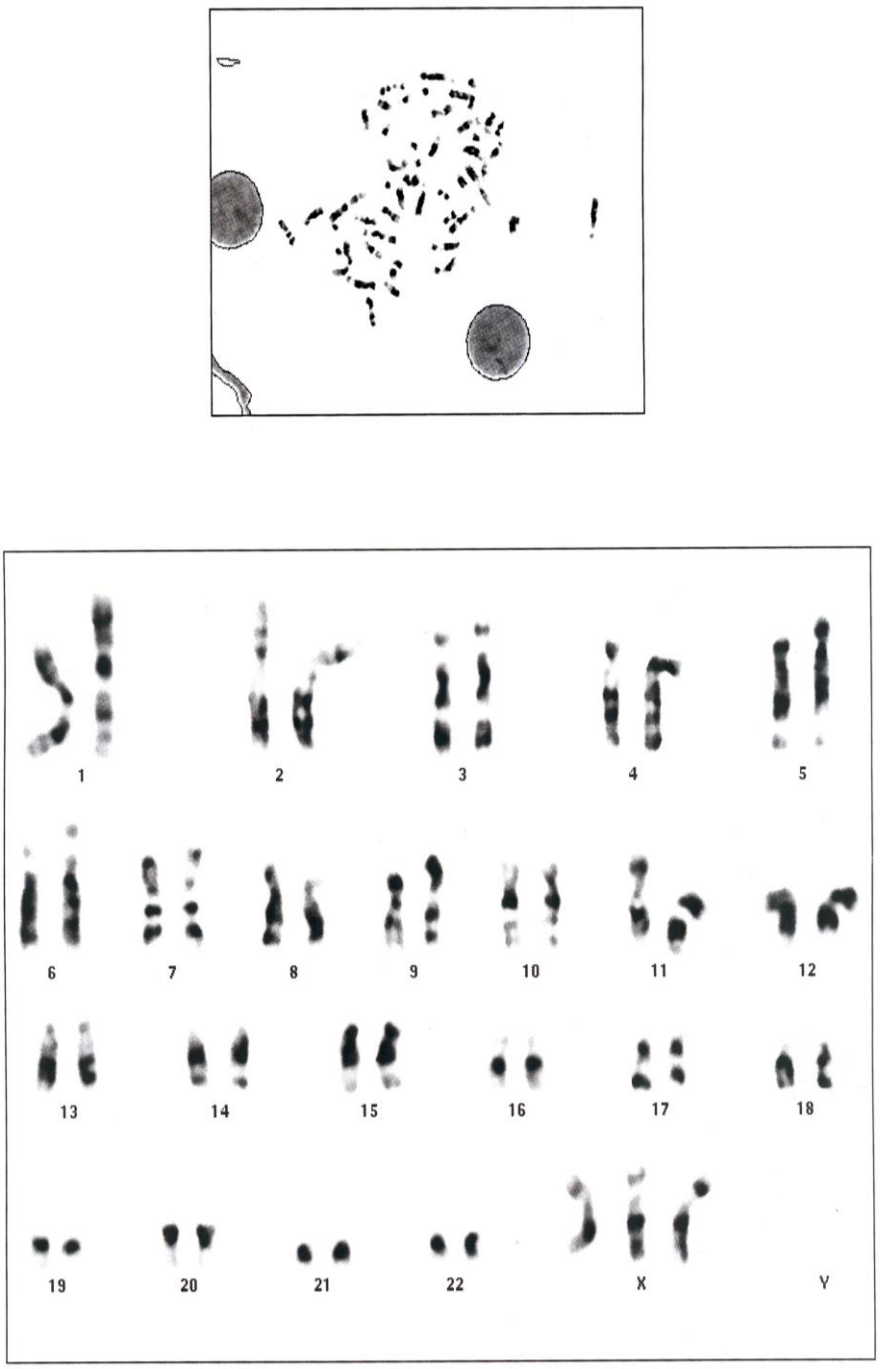


Figure (32) : Shows: 47,XXX

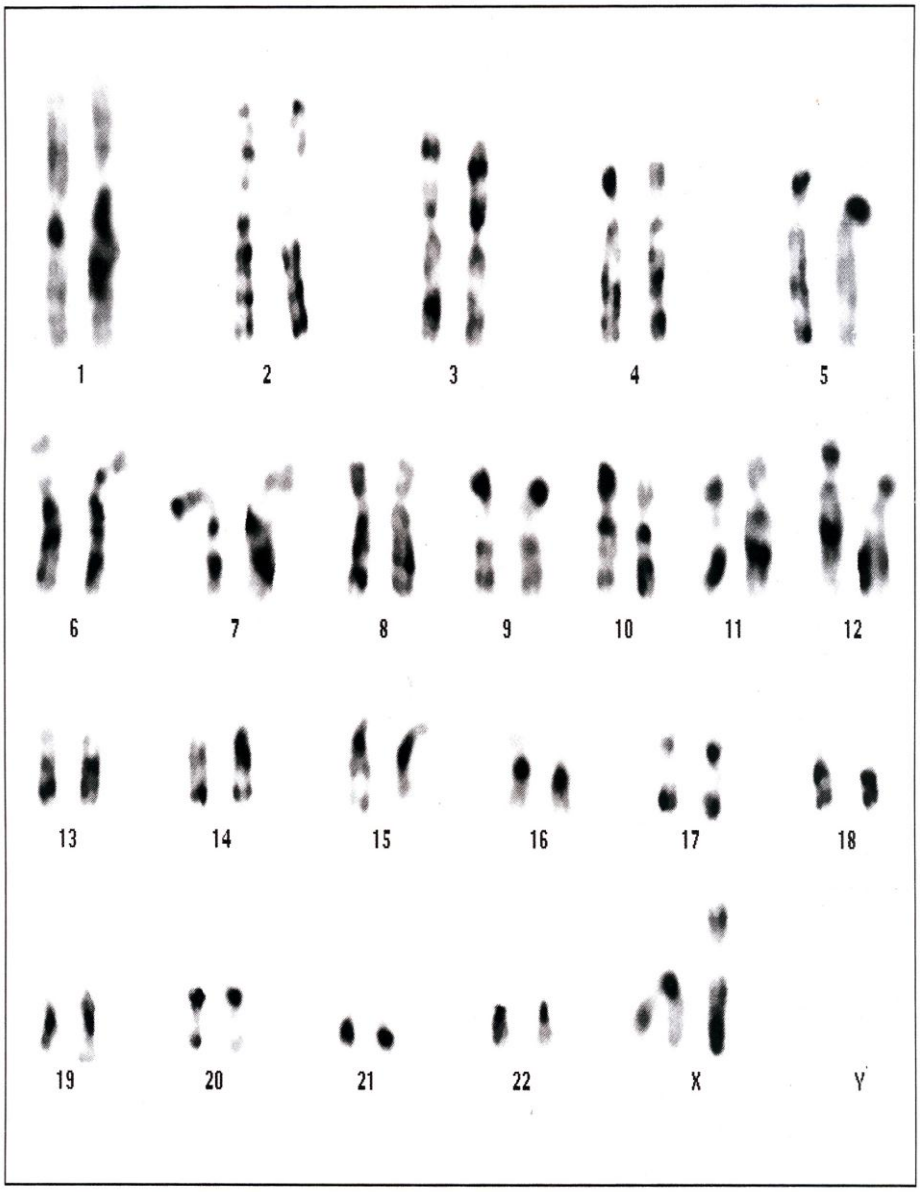


Figure (33) : Shows:48,XY,+5,i(7) (q10),+8, der (19)

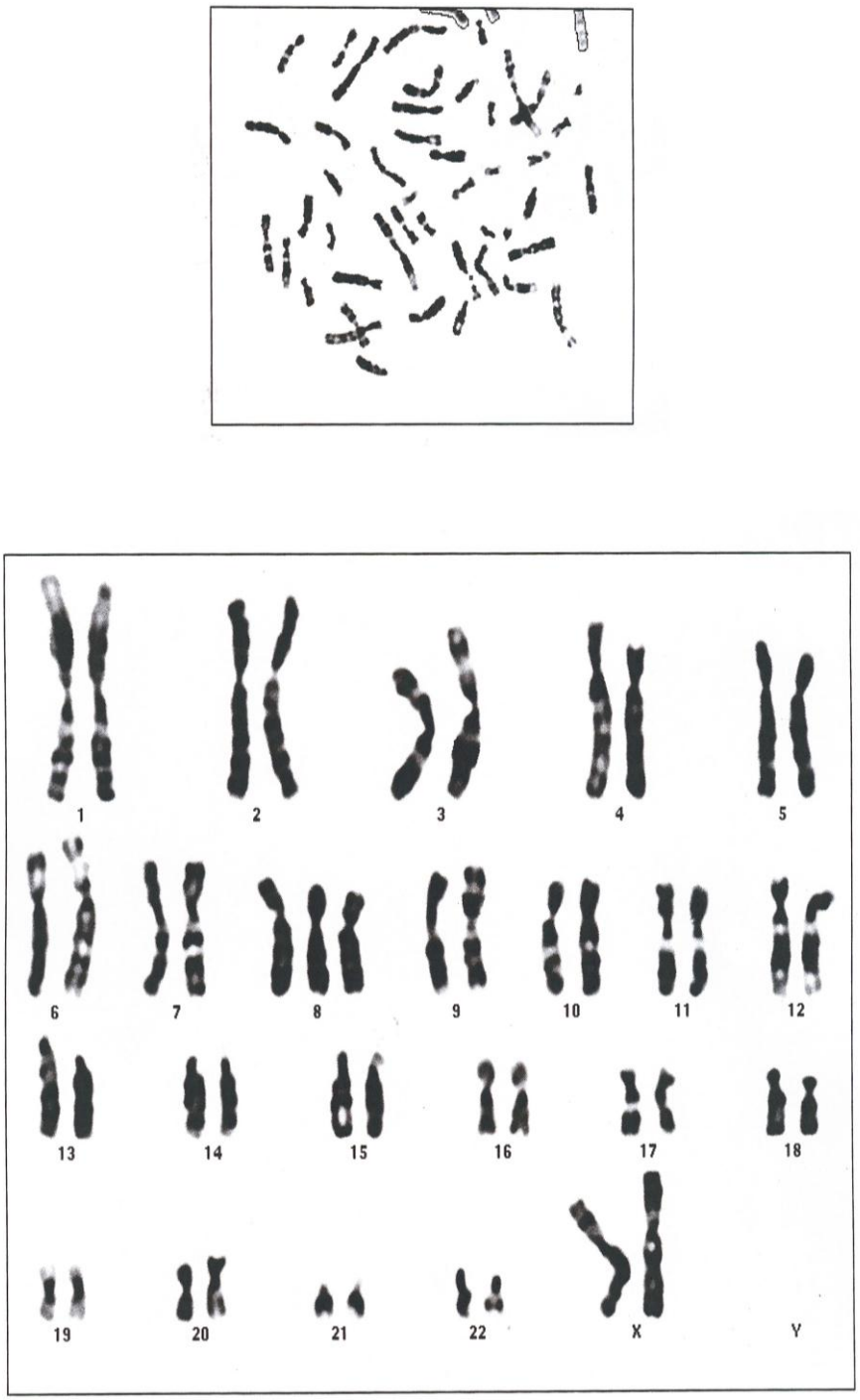


Figure (34) : Shows: 47,XX,+8

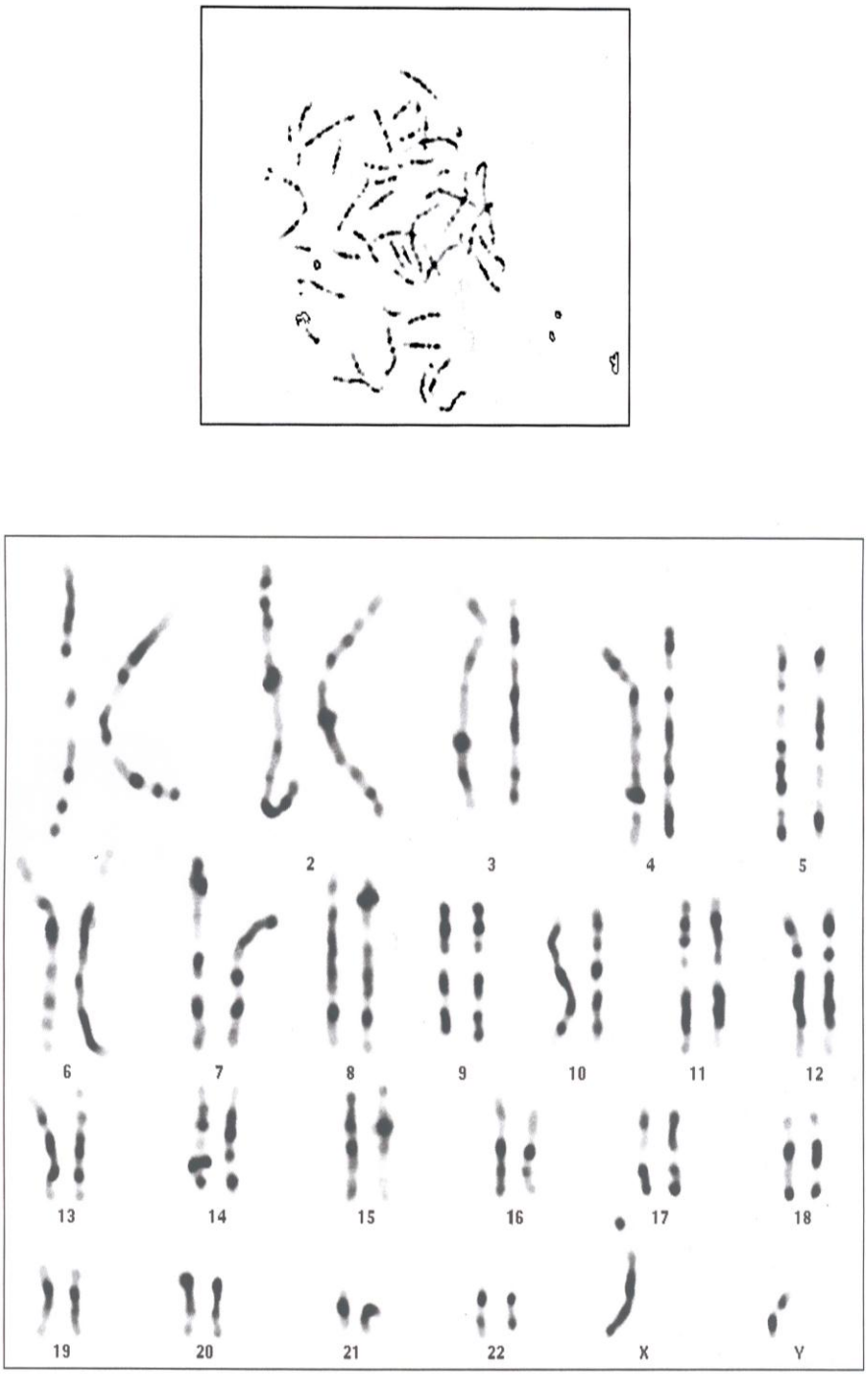


Figure (35) : Shows: 46,XY, t(11;22) (q23;q11)

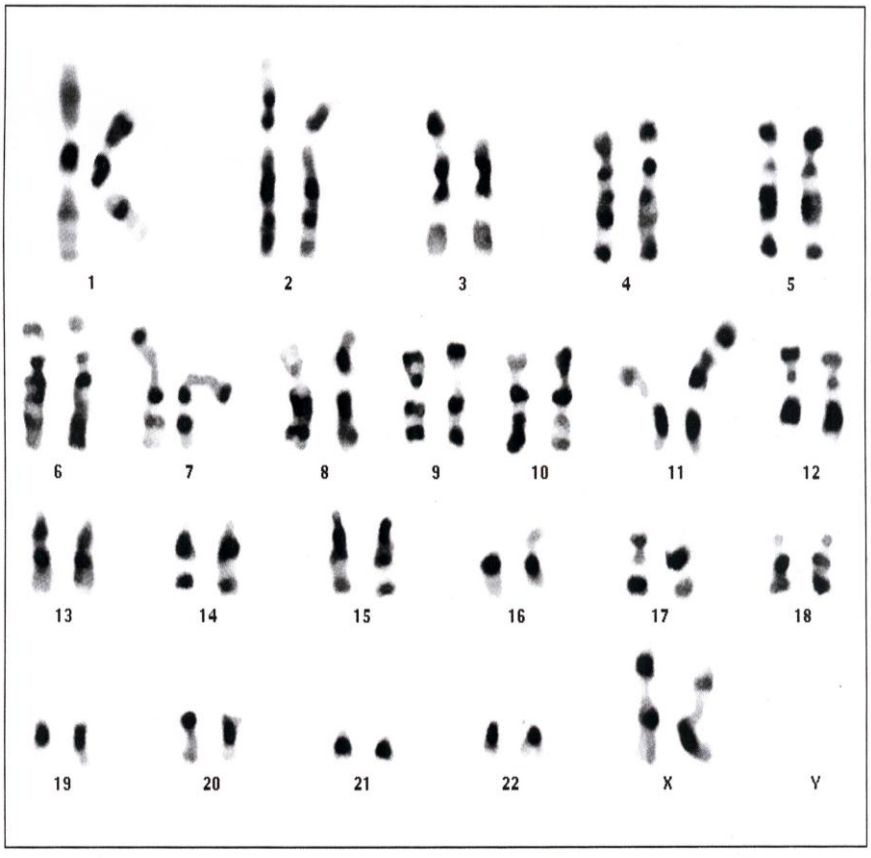


Figure (36) : Shows: 46,XX, t (3;11) (p21; P13)

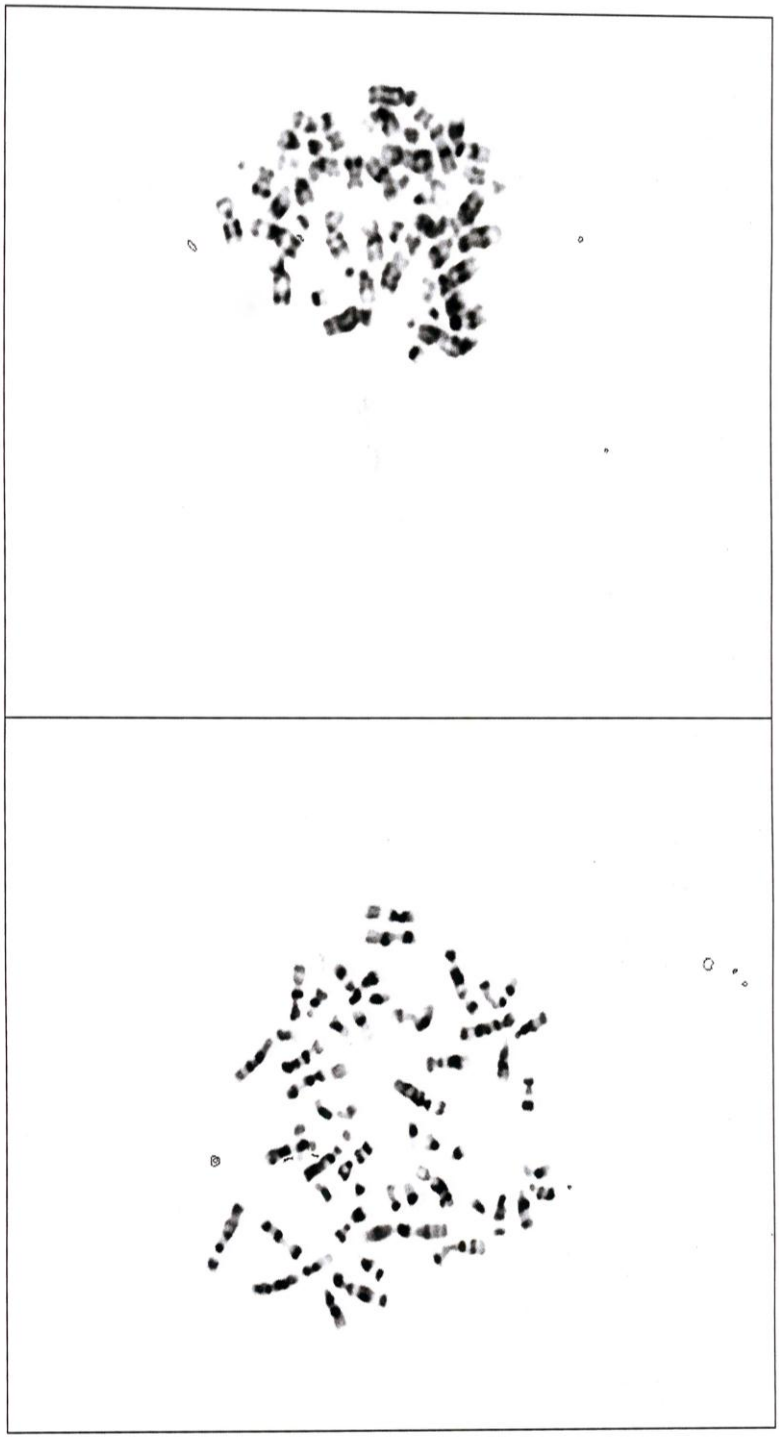
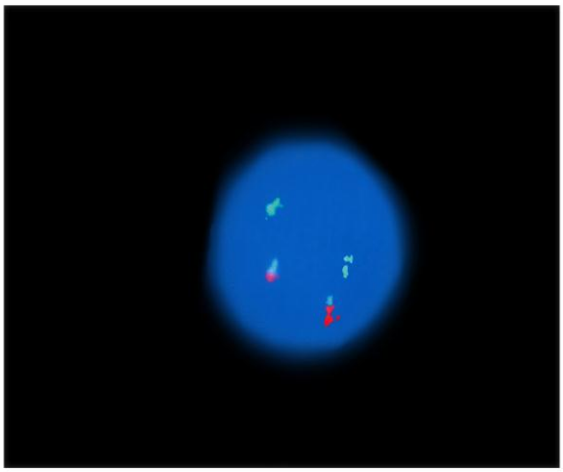
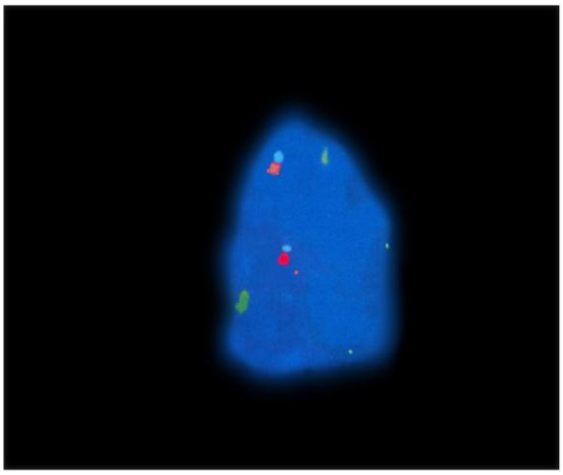


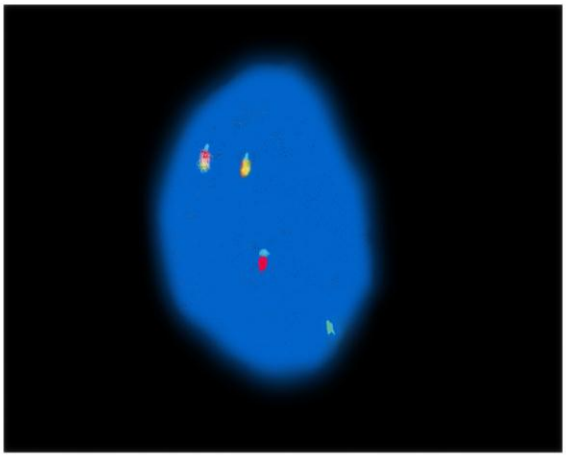
Figure (37) : Shows 46,XX, t(3;11) (p21;p13)



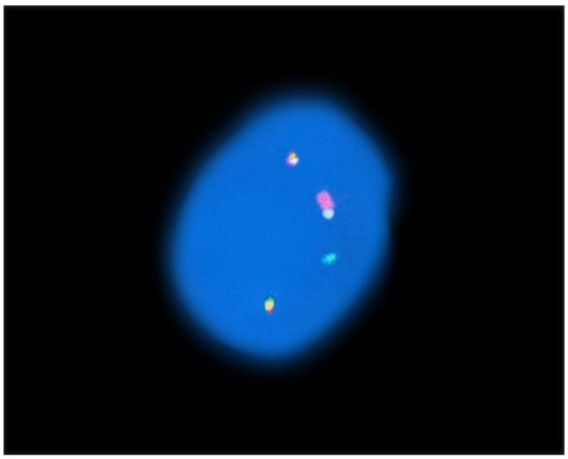
Photograph (1): Fluorescence in situ hybridization (FISH) analysis using LSI MYC / IGH / CEP8 Dual fusion probe shows : interphase with two green (14q32) (IGH), two orange (8q24) (MYC) and two blue (CEP8) signals.



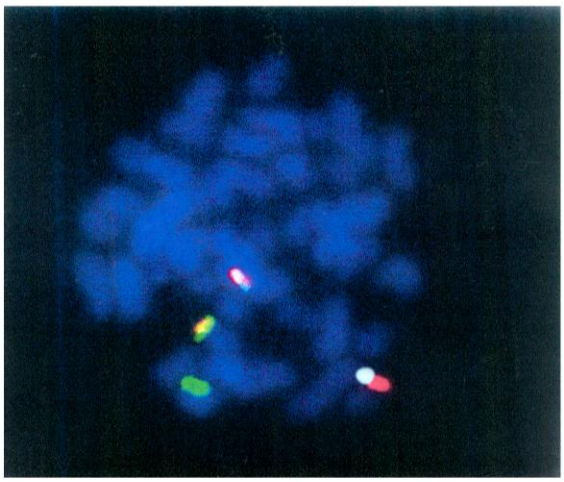
Photograph (2): Fluorescence in situ hybridization (FISH) analysis using LSI MYC / IGH / CEP8 Dual fusion probe shows : interphase with two green (14q32) (IGH), two orange (8q24) (MYC) and two blue (CEP8) signals.



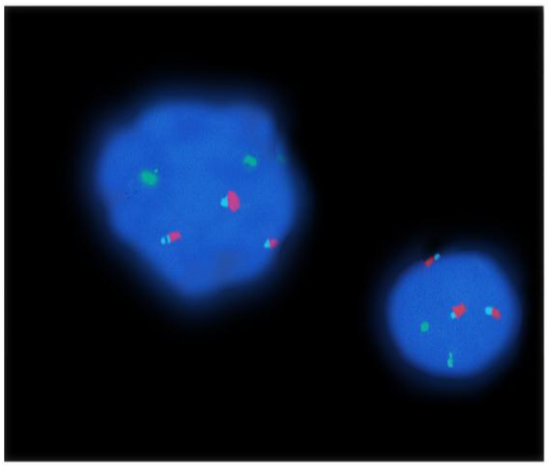
Photograph (3) : Fluorescence in situ hybridization (FISH) analysis using LSI MYC / IGH / CEP8 Dual fusion probe shows : interphase with two orange / green t(8;14) (MYC;IGH) fusion signals, one green (14q32) (IGH), one orange (8q24) (MYC) and one blue (CEP8) signals.



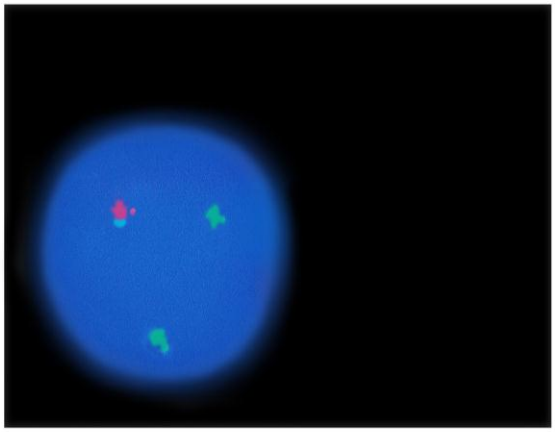
Photograph (4) : Fluorescence in situ hybridization (FISH) analysis using LSI MYC / IGH / CEP8 Dual fusion probe shows : interphase with two orange / green t(8;14) (MYC;IGH) fusion signals, one green (14q32) (IGH), one orange (8q24) (MYC) and one blue (CEP8) signals.



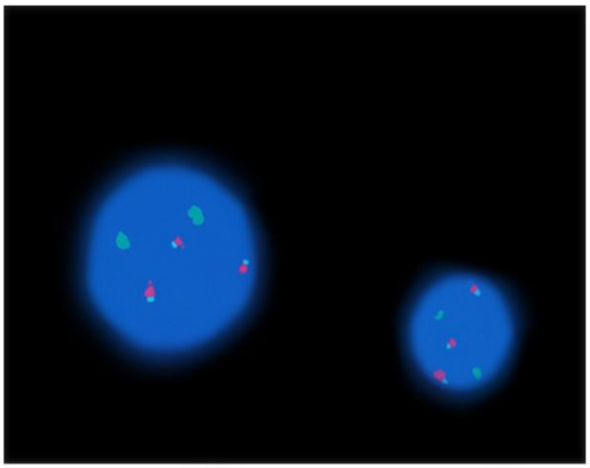
Photograph (5): Fluorescence in situ hybridization (FISH) analysis using LSI MYC / IGH / CEP8 Dual fusion probe shows : metaphase with two orange / green t(8;14) (MYC;IGH) fusion signals, one green (14q32) (IGH), one orange (8q24) (MYC) and one blue (CEP8) signals.



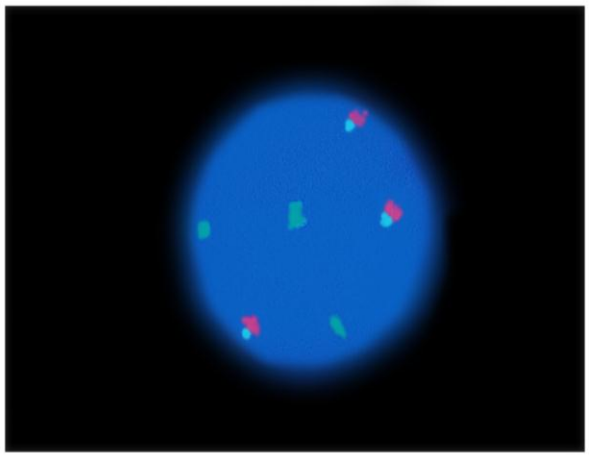
Photograph (6): Fluorescence in situ hybridization (FISH) analysis using LSI MYC / IGH / CEP8 Dual fusion probe shows : interphase with two green (14q32) (IGH), three orange (8q24) (MYC) and three blue (CEP8) signals.



Photograph (7) Fluorescence in situ hybridization (FISH) analysis using LSI MYC / IGH / CEP8 Dual fusion probe shows : interphase with two green (14q32) (IGH), one orange (8q24) (MYC) and one blue (CEP8) signals.



Photograph (8): Fluorescence in situ hybridization (FISH) analysis using LSI MYC / IGH / CEP8 Dual fusion probe shows : interphase with two green (14q32) (IGH), three orange (8q24) (MYC) and three blue (CEP8) signals.



Photograph (9): Fluorescence in situ hybridization (FISH) analysis using LSI MYC / IGH / CEP8 Dual fusion probe shows : interphase with three green (14q32) (IGH), three orange (8q24) (MYC) and three blue (CEP8) signals.

The Statistical paragraph in material and methods:

Data were statistically described in terms of range, mean ± standard deviation (± SD) frequencies (number of cases) and percentages when appropriate. Comparison between the study groups was done using Chi square ($\chi 2$) test. Exact test was used in stead when the expected frequency is less than 5. A probability value (p value) less than 0.05 was considered statistically significant. All statistical calculation were don using computer programs Microsoft Excel 2003 (Microsoft Corporation, NY, USA) and SPSS (Statistical Package for the Social Sciences; SPSS Inc., Chicago, IL, USA) version 15 for Microsoft Windows.