RESULTS

RESULTS

This study attempted to determine whether serum CEA and serum ferritin could be used as tumour markers to monitor therapy in head and neck cancer patients.

Comparison:

We obtained sera from two groups, the first included healtlhy individuals with a history of chronic cigarette smoking, (10 individuals) and the second group included healthy individuals without history of smoking (10 individuals).

1] In our series.

The mean serum CEA levels for control individuals (n= 20) was 3.72 ng/ml (table 3).

The mean CEA level for smokers group was 4.70 ng/ml (table 4).

While that for nonsmokers was 2.7 ng/ml (table 4)
The correlation was highly significant (Fig. 4)

The mean serum Fer level for control individuals (n = 20) was 40.87 ng/ml (table 3).

The mean serum fer level for smokers group was 44.59 ng/ml (table 5)

While that for nonsmokers group was 37.14 ng/ml (table 5).

The correlation was significant increase in smokers than nonsmsokers (Fig 2).

2-Benign lesions :

We obtained sera from 20 patients with benign lesions in head and neck before the beginning of treatment, during treatment and after treatment.

[A] The mean serum CEA level for indiviuals with benign lesions before treatment was 10.83 ng/ml (table 7)It decreased significantly during treatment to 6.66 ng/ml and also decreased significantly after treatment to 4.05 ng/ml. (table 7 & Fig 3)

[B] The mean serum Fer level for patients with benign lesions before treatment was 118.9 ng/ml (table 8) decreased significantly during treatment to 81.21 ng/ml and also decreased significantly after treatment to 51.63 ng/ml (table 8 & Fig 4).

3] Comparison : of mean serum CEA & Fer levels for control individuals and these with benign lesions during stages of treatment

The correlations were highly significant as compared to control group. (Table 7,8)

4] Smoking in benign lesions :

The serum CEA level in smokers in benign group before treatment was 11.93 ng/ml and for nonsmoker in the same group was 10 ng/ml. (n = 10)

This correlation was insignificant (tab 9, Fig 5)

The serum CEA level for smokers in benign group during treatment was 7.1 ng/ml for nonsmokers it was 6.2 ng/ml (tab 10 & Fig 6)

The correlation was significant

The serum CEA level for smokers in benign group after treatment was 4.6 ng/ml and for nonsmokers it was 3.5 ng/ml (tab 11, Fig 7).

The correlation was significant

As for serum Fer levels:

- For smokers in benign group before treatment it was 129.5 ng/ml and for nonsmokers it was 108.3 ng/ml (n = 10) (table 12 & Fig 8)

The correlation was insignificant.

- For smokers in benign group under treatment it was 87.8ng/ml and for nonsmokers it was 74.6 ng/ml (tab 13, Fig 9) .

  The correlation was insignificant

- For smokers in benign group after treatment serum ferritin level was 52 ng/ml and for nonsmokers it was 51.25 ng/ml .

  The correlation was insignificant

*** *** ***

5] Incidence of election:

- for benign lesions before treatment:

- The highest serum CEA level of control individuals was 5.77 ng/ml
- The number of positive cases, was 19/20

  The percentage of positive cases at the cut -off level was 95% (table 15).
- The number of positive cases of ferritin in the same group was 20/20.
- The percentage of positive cases of ferritin at the cut-off level was 100% (table 15).

for benign lesions under treatment :

- The number of positive cases of CEA was 17/20.
- The percentage of positive cases of CEA at the cut -off level of control group was 85% (table 16).
- The number of positive cases of fer was 18/20
- The percentage of positive cases at the cut -off level of control group was 90% (table 16).

for benign lesions after treatment :

- The number of positive cases of CEA was 3/20
- The percentage of positive cases of CEA was 15%.
- The number of positive cases of Fer was 7/20.
- The percentage of positive cases at the cut -off level of control group was 35% (table 17).

6] The anatomical distribution of benign lesions at various sites in the nose, thyroid, larynx, salivary glands, mouth and ear. was insignificant . (Table 18).

7] Malignant lesions :

1] The mean serum CEA level for patients with malignant lesions before treatment was 19.46 ng/ml, during treatment at was 11.41 ng/ml and after treatment it was 6.32 ng/ml (table 20, Fig 11)

There is significant decline in serum CEA level during the course of treatment and especially so after its completion.

2] The mean serum Fer level for patients with malignant lesions before treatment was 225.2 ng/ml; during treatment it declines to 153.2 ng/ml and after the completion of treatment it was 108.2 ng/ml (table. 21 Fig 12).

There is significant decline in serum fer level during the course of treatment and especially so after its completion.

These results represents the importance of these tumour markers in assuming response to therapy.

8) Comparison of the three groups :

We compared the serum CEA and Fer levels in control, benign, and malignant patients during the course of the course of the disease i.e. before the beginning of treatment, during the course of treatment and after its completion : (table 20 , 21 Fig 11 , 12)

The correlation there was highly significant indicating the importance of these tumour markers in assuming tumour burden and prognosis.

9) Smoking in malignant lesions :

1) The serum CEA level in smokers in malignant group before treatment was 21,14 ng/ml while in nonsmokers it was 18.15 ng/ml (n = 10) (table 22, Fig. 13)
The correlation showed significant rise of serum CEA level in smokers.

2) The serum CEA level in smokers in malignant group during the course of treatment was 12.4 ng/ml while in nonsmokers it was 10.4 ng/ml (table 23, Fig. 14).
The correlation here was significant

3) The serum CEA level in smokers in malignant group after the completion of treatment by 3 months was

6.84 ng/ml while in nonsmokers it was 5.75 ng/ml (table 24, Fig. 15).

The correlation here was insignificant

As for serum ferritin levels :

1] In smokers in malignant group before treatment it was 241.4 ng/ml while in non smokers it was 208.7 ng/ml (n = 10) (table 25- Fig 16).

The correlation was highly significant

2] In smokers in malignant group during treatment serum ferritin level was 164.7 ng/ml while in non smokers it was14.9 ng/ml (table 26 - Fig 26) The correlation was significant

3] In smokers in malignant group after the completion of treatment, it was 114.1 ng/ml while in non smokers it was 102.2 ng/ml (table 27-Fig. 18)

The correlation here was insignificant

10) Distribution of malignant lesions according to their anatomical sites in hypopharynx, larynx, orbit, auricle, nose, maxilla, tonsil and thyroid was insignificant (Table 28).

11) the incidence of election of malignant lesions in different stages of treatment at the cut-off level of control group :

1.a] for malignant lesions before treatment:

- The control highest level of serum CEA was 5.77 ng/ml.
- The number of positive cases was 20/20.
- The parentage of positive cases was 100% (tab.29)

b] The control highest level of serum ferritin was 52.83 ng/ml

- The number of positive cases was 20/20.

- The percentage of positive cases at the cut-off level of control group was 100 % (table 29).

2.a] As for malignant lesions under treatment :

- The number of positive cases was 20/20 [for CEA]
- The percentage of positive cases was 100 % (table 30).

- The number of positive cases was 20/20 [for Fer]
- The percentage of positive cases was 100 % (table 30)

3.a] for malignant lesions after treatment :

- The number of positive cases was 13/20 [for CEA]

- The percentage of positive cases was 655% (table 31).

- The number of positive cases of Fer was 19/20.
- The percentage of positive cases was 95 %

12) The incidence of election of malignant lesions in different stages of treatment at the out-off level of benign lesions :

1.a] For malignant lesions before treatment :

- Benign highest level of serum CEA before treatment was 13.67 ng/ml.
- The number of positive case was 19/20.
- The percentage of positive case was 95% (table 32)

b] Benign highest level of serum ferritin before treatment was 170.1 ng/ml

- The number of positive cases was 19/20
- The percentage of positive cases was 95% (table 32)

2.a] For malignant lesions during treatment

- Benign highest level of serum CEA under treatment was 8.1 ng/ml.
- The number of positive cases was 19/20.
- The percentage of positive cases was 95%(table 33).

b] Benign highest level of serum ferritin under treatment was 109.3 ng/ml.

- The number of positive cases was 19/20.

- The percentage of positive cases was: 95 % (table 33)

3.a] For malignant lesions after treatment :

- Benign highest level of serum CEA after treatment was 5.98 ng/ml.
- The number of positive cases was 10/20
- The percentage of positive cases was 50% (table 34)

b] Benign highest level of serum fer after treatment was 68.6 ng/ml

- The number of positive oases was 19/20
- The percentage of positive cases was 95% (table 34)

13) Serum ferritin and CEA levels were seen to correlate with stage of the disease. The serum levels in stage I and II disease were significantly lower than in patients with stage III and IV disease (table 19).

14) The serum ferritin and CEA levels were seen to decline towards normal levels in a group of patients who had been treated and remained clinically free of disease for at least 3 months after the completion of treatment some patients, especially in benign group, their serum levels may reach the control levels.

Table 17 showed that:

- 85% of benign patients, their serum CEA levels

reached the control levels

- 65% of benign patients, their serum Fer levels reached the control levels.

Table 31 Showed that :

- 35% of malignant patients, their serum CEA levels after treatment reached the control levels.
- And only 15% of malignant patients, their serum ferritin levels reached the control levels.

Many explanations had been postulated to explain the sustained high serum CEA and ferritin levels especially in malignant tumours after the completion of treatment (65% of patients had high CEA levels and 85% of had high serum ferritin levels .

A- Metastatic spread Explanation:

Metastatic spread by the blood stream in head and neck cancers is not common, and cases have been reported with deposits in lungs, liver, bones, and occasionally other sites, sometimes three or four years after the operation on the head and neck cancers and when there has been no evidence of local recurrence.(Silverman et al 1976)

B- Occurrence of recurrence, Presence of residue

Unfortunately there are difficulties after treatment in detecting further growth before it has reached an advanced stage and this is well illustrated by the very large number of patients reported in numbers series who succumb to their disease and hence their high serum tumour markers levels after being treated. (wig et al 1983).

Treatment of any type alter the tissues and subsequent examination is a matter of determining whether the abnormalities are those which would be expected or whether they indicate that active tumour is still present. While positive biopsies confirm the presence of growth, negative biobsy findings in no way exclude the possibility After both radiotherapy and surgical excision there may well be healing of the surface where there is still active growth in the deeper tissue In all, serum tumour markers levels is still high (wig et al 1983)

C- Multiple primary tumours Explanations

A number of papers stress the occurrence of synchronous and metachronous second and third primary tumours in patients with head and neck cancer. Al Sarraf et al (1981) found 6.5% of second primary corcinomatous within the respiratory tract in patients with glottic carcinoma and

12.3% in those with supraglottic carcinoma; more than half of these tumours were located in the lungs and have to be separated from metastases.

D- The Occult Primary Explanation

A patient presenting with a metastatic cervical malignancy from an unknown primary source is said to have an occult primary (Hamada and Hamada 1977).

In a series of patients reported by Ishakawa and Hamada (1976) the average time from the first time of a mass presenting in the neck to the time of the patient's initial evaluation was 5.1 months.

Current methods of investigation are unable to detect tumours in the body until about 1 gm of tumour, consisting of approximately 10^9 cells, is present. generally speaking as a patient is likely to die then the total number burden reaches between 10^{12} and 10^{13} cells (that is 1-10 kg tumour weight), it follows that the tumour will already be at least two-thirds of the way through its life span before it is detected. Using this criterion, most tumours in man must be late or at advanced stage at the time of initial presentation and hence a high serum tumour markers level when first detected, and also it does not rapidly disappear during and after treatment and hence the

sustained high serum tumour marker level for a while after treatment. (Saad et al 1984).

Saad et al (1984) reported the following primary sites which should always be under suspicion as a source for a metastatic node in the cervical region nasopharynx, tonsil, base of tongue hypopharynx, and thyroid.

E- Progression and regression Periods

Any tumour, to attain an existence, and consequently a high serum tumour markers level, takes a period, this period depends upon; the type of the tumour, the rate of growth, the size of the tumour, the presence of metastases, etc.

This tumour, to retain its control serum tumour markers levels needs some time; which also depends upon; the type of the tumour, the effectiveness of therapy, the rate of regression, the effectiveness of treatment of secondaries. (Steel and Mc Cormiek 1985).

Similarly wells et al 1987, Walf et al 1979 had shown that increase in serum alpha I antitrepsin, and alpha I acid glycoprotein levels correlate very closely with tumour stage and regional involvement in head and neck cancer.

14) We believe, that the current study provides sufficient evidence to support ferritin and CEA as a good serum marker in head and neck tumours.

(Table 2) shows Control group; their age, sex, habit, serum Fer and CEA levels, their mean, S. D., S. E.

CONTROL GROUP

Table (2)

No.	age	Sex	CEA	Fer	Habit
1	38	F	4.398	41.27	nonsmoker
2	42	F	3.00	36.61	nonsmoker
3	47	M	4.70	49.60	smoker
4	15	M	0.00	20.47	nonsmoker
5	32	F	3.98	33.94	nonsmoker
6	30	F	4.142	48.77	nonsmoker
7	37	F	0.27	39.69	nonsmoker
8	47	m	3.33	44.15	smoker
9	32	F	2.17	40.94	nonsmoker
10	50	M	4.55	31.72	smoker
11	52	M	3.45	33.57	smoker
12	60	M	5.42	43.98	smoker
13	68	M	4.90	28.88	nonsmoker
14	25	M	5.77	48.07	smoker
15	58	M	4.84	46.66	smoker
16	64	M	5.10	47.54	smoker
17	18	F	3.60	40.72	nonsmoker
18	62	M	4.86	52.83	smoker
19	65	F	0.56	40.12	nonsmoker
20	75	M	5.44	47.79	smoker
mean	45.85	11 M / 9 F	3.72	40.87	10 nonsmoker / 10 smoker
S.D.			+3.72	+ 8.1	
S.E			0.36	1.8	

(Table 3) shows serum CEA and Fer levels in control group; range, mean, S>D. and S. E.
mean serum CEA = 3.72 ng/ml
mean serum Fer = 40.87 ng/ml

(Table 4) A comparison of serum CEA levels in smokers and nonsmokers in control group

Serum CEA level in smokers = 4.7 ng/ml
Serum CEA level in smokers = 2.7

the correlation is highly significant

(Table 5) A comparison of serum Fer levels in smokers and nonsmokers in control group

Serum Fer level in nonsmokers = 37.14 ng/ml
Serum Fer level in nonsmokers = 44.59 ng/ml

The correlation is significant

Table (3)
Serum CEA and Ferritin Levels
in CONTROL group

	CEA	Fer
range	0.0 - 5.77	20.47 - 52.83
mean	3.72	40.87
size	20	20
S.D.	± 1.6	± 8.1
S.E	0.36	1.8

Table (4)
Sarum CEA Levels in smokers and nonsmokers
in CONTROL group

	nonsmokers	smokers
range	0.0 - 4.9	3.33 - 5.66
mean	2.70	4.70
size	10	10
S,D	±1.74	± 0.76
S.E.	0.55	0.24
t		3.45

P < 0.01
** highly significant

Table (5)
Serum Ferritin levels in smokers and nonsmokers
in CONTROL group

	nonsmokers	smokers
range	28.88 - 48.77	31.72 - 52.83
mean	37.14	44.59
size	10	10
S.D	± 7.5	± 6.4
S.E	2.3	2.04
t		2.4

P < 0.05
* singificant

(Fig. 1)

A comparison of serum CEA levels in smokers and non smokers in Control group

The correlation is highly significant

(Fig. 2)

A comparison of serum Fer levels in smokers and nonsmokers in control group

The correlation is significant .

Fig (1)

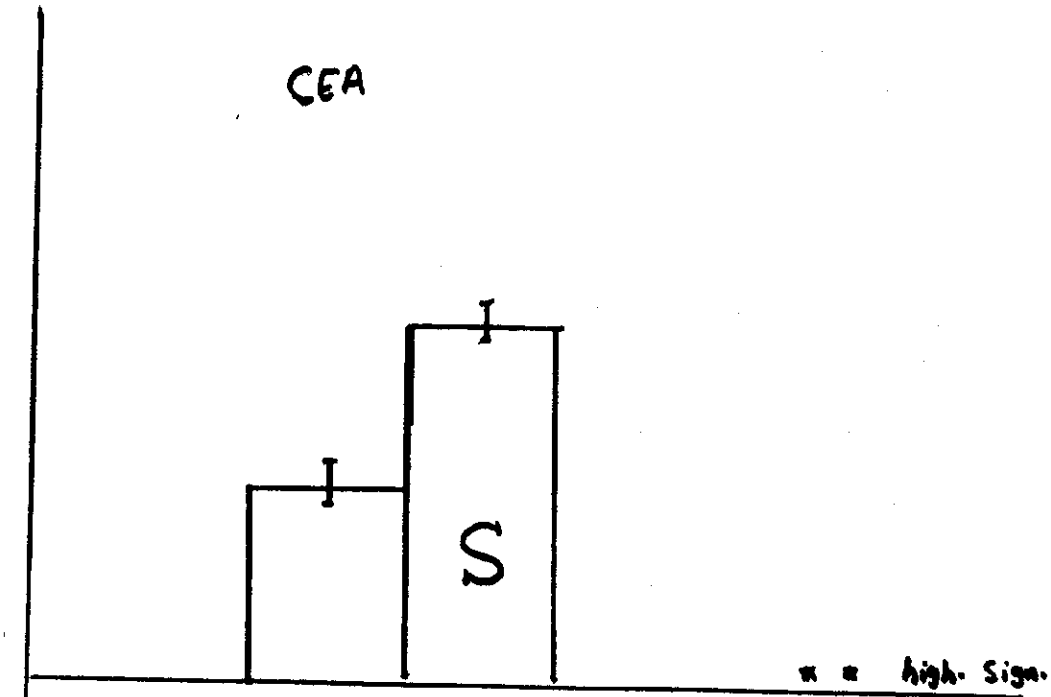
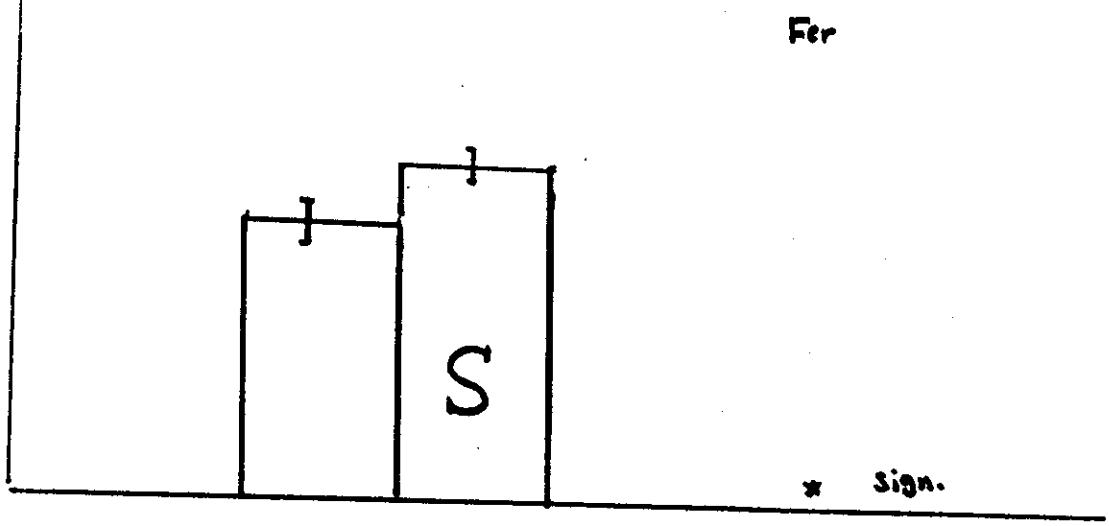


Fig (2)



(Table 6) Shows benign tumours. of head and neck;the type of the lesion, habit of the patient, age, sex, serum Fer and CEA levels before under and after treatment;

The mean of serum Fer & CEA levels, S. D., S. E. and t.

Table (6)
BENIGN tumours of head and neck

	Type of the lesion	habit	age	sex	CEA before	CEA under treatment	CEA after	Fer before	Fer under treatment	Fer after
1	benign Lt laryngeal papilloma	S	37	M	10.10	7.37	4.21	112.9	85.3	47.3
2	benign Lt Laryngeal papilloma	S	52	M	12.00	7.9	4.02	129.3	86.6	55.6
3	benign Rt laryngeal papilloma	S	48	M	11.60	5.73	3.91	121.9	81.2	49.3
4	benign thyroid adenoma		34	F	12.00	8.01	5.98	127.3	83.3	50.1
5	benign thyroid adenoma	S	51	M	13.49	6.12	3.94	135.1	96.3	55.5
6	benign thyroid adenoma		28	F	11.00	6.6	4.72	128.8	91.1	45.3
7	benign thyroid adenoma		23	F	13.31	6.12	3.20	150.1	102.3	68.6
8	benign papilloma of the nose		44	F	8.00	5.43	2.77	94.8	66.1	44.2
9	benign papilloma of the nose	S	52	M	8.27	6.81	4.41	109.9	67.7	49.9
10	benign papilloma of the nose		32	F	7.98	5.89	3.64	97.7	69.9	43.2
11	benign nasal papilloma (lt)		41	F	9.108	6.41	2.90	101.8	65.4	53.3
12	benign nasal papilloma (Rt)		50	F	10.00	6.62	4.32	119.1	89.7	45.5
13	pleomorphic adenoma of Lt parotid gland	S	45	M	13.00	7.91	5.79	135.5	88.7	40.2
14	pleomorphic adenoma of Rt parotid gland	S	41	M	13.43	7.10	3.15	131.5	85.7	59.1
15	benign papilloma of the tongue		22	F	8.852	5.83	1.88	69.8	49.2	49.2
16	benignn papilloma of the tongue		25	F	12.073	6.98	4.10	128..2	82.3	60.2
17	benign papilloma of hard palate		22	F	10.70	8.1	5.81	102.6	75.8	46.6
18	Capillary haemangioma of the tongue		17	F	5.00	3.57	1.56	71.3	51.3	51.1
19	Glomus tumour of Rt ear	S	23	M	13.10	7.207	4.98	170.1	109.3	66.1
20	Glomus tumour of Rt ear	S	22	M	13.67	7.49	5.68	140.2	97.2	52.2
	Mean				10.83	6.66	4.049	118.9	81.21	51.63
	S.D.			±	2.385	± 1.092	±1.249	±23.98	± 15.43	± 7.3
	S.E.				0.532	0.244	0.279	5.36	4.45	1.6
	t					-7.132	-11.22		- 5.9	- 7.77

(Table 7) A comparison between serum CEA levels in control and benign groups (before, under and after treatment) showing the mean, range, size. S.D., S. E. and

The correlation is highly significant

(Table 8) A comparison between serum Fer levels in control and benign groups (before, under and after treatment)showing the mean, range, size, S.D., S. E. and t

The correlation is highly significant.

Table (7)

A Comparison of serum CEA levels in CONTROL and BENIGN groups

	CONTROL	BENIGN before treatment	BENIGN under treatment	BENIGN after treatment
mean	3.72	10.83	6.66	4.05
range	0.00-5.77	5.0-13.67	3.57-8.1	1.56-5.98
size	20	20	20	20
S.D.	+ 1.6	+ 2.38	1.09	1.25
S.E.	0.36	0.53	0.24	0.28
t		-17.5	- 7.1	- 11.2
		P< 0.01 ** highly sign.	P<0.01 ** highly sign.	P < 0.01 ** highly sign.

Table (8)

A Comparison of serum Fer levels in CONTROL and BENIGN GROUPS

	Control	before treatment	under treatment	after treatment
mean	40.87	118.9	81.21	51.63
range	20.47-52.83	69.8- 170.1	51.1-109.3	40.2-68.6
size	20	20	20	20
S.D.	+ 8.1	+ 23.98	+ 15.4	+ 7.3
S.E.	1.8	5.36	3.45	1.6
T		13.8	- 5.9	- 7.77
		P < 0.01 ** highly sign.	P< 0.01 ** highly sign.	P < 0.01 ** highly sign.

(Fig 3) A comparison between serum CEA levels in control and benign groups (before under and after treatment)

The correlation is highly significant.

(Fig 4) A comparison between serum FER levels in control and benign groups (before, under , and after Treatment)

The correlation is highly significant

Fig (3a)

CEA

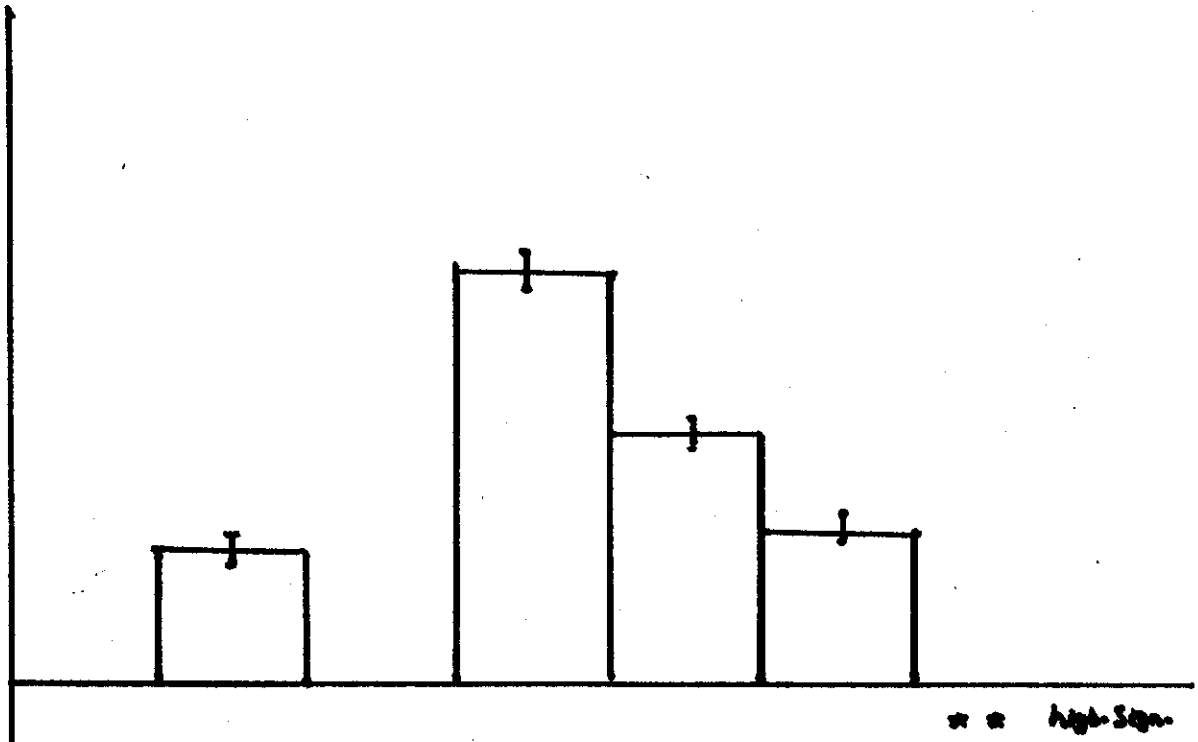
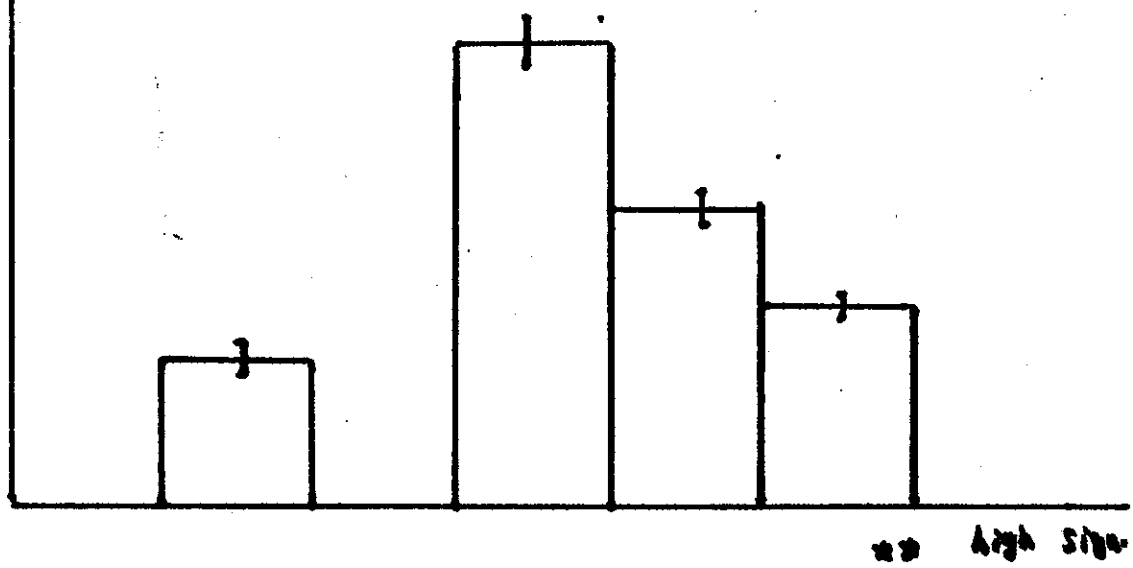


Fig (4)

Fer.



(Table 9) A comparison of serum CEA levels in smokers and nonsmokers in benign group before treatment.

mean serum CEA level in nonsmokers = 10 ng/ml
mean serum CEA level in smokers = 11.93 ng/ml

The correlation is insignificant

(Table 10) A comparison of serum CEA levels in smokers and nonsmokers in benign group during treatment.

mean Serum CEA level in nonsmokers = 6.2 ng/ml
mean Serum CEA level in smokers = 7.1 ng/ml

The correlation is significant.

(Table 11) A comparison of Serum CEA levels in smokers and nonsmokers in benign group after treatment

mean Serum CEA level in nonsmokers = 3.5 ng/ml
mean Serum CEA level in smokers = 4.6 ng/ml

The correlation is significant

Table (9)

A Comparison of serumc CEA levels in smokers and nonsmokers in BENIGN group (before treatment)

	nonsmokers	smokers	Remarks
mean	10	11.93	P> 0.05
range	5.0 - 13.31	10.0- 13.67	
size	10	10	
S.D.	2.34	1.7	insignificant
S.E.	0.74	0.54	
t		2.11	

Table (10)

A Comparison of serumc CEA levels in smokers and nonsmokers in BENIGN group (under treatment)

	nonsmokers	smokers	Remarks
mean	6.2	7.10	P< 0.05
range	3.57- 8.01	5.73-8.1	
size	10	10	
S.D.	1.15	0.75	* Significant
S.E.	0.36	0.24	
t		2.6	

Table (11)

A Comparison of serumc CEA levels in smokers and nonsmokers in BENIGN group (after treatment)

	nonsmokers	smokers	Remarks
mean	3.5	4.6	P < 0.05
range	1.56 - 5.98	3.91 0- 5.81	
size	10	10	
S.D.	1.26	0.87	* Significant
S.E.	0.4	0.28	
T		2.55	

(Fig. 5) A comparison of serum CEA levels in smokers and nonsmokers in benign group before treatment.

mean serum CEA level in nonsmokers = 10 ng/ml
mean serum CEA level in smokers = 11.93 ng/ml

The correlation is insignificant

(Fig. 6) A comparison of serum CEA levels in smokers and nonsmokers in benign group during treatment.

mean Serum CEA level in nonsmokers = 6.2 ng/ml
mean Serum CEA level in smokers = 7.1 ng/ml

The correlation is significant.

(Fig. 7) A comparison of Serum CEA levels in smokers and nonsmokers in benign group after treatment

mean Serum CEA level in nonsmokers = 3.5 ng/ml
mean Serum CEA level in smokers = 4.6 ng/ml

The correlation is significant

Fig (5)

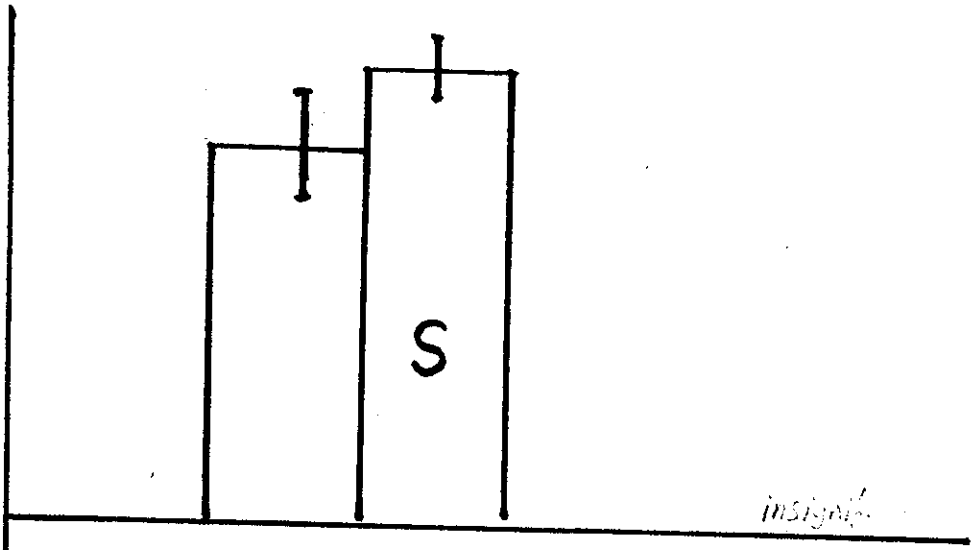


Fig. (6)

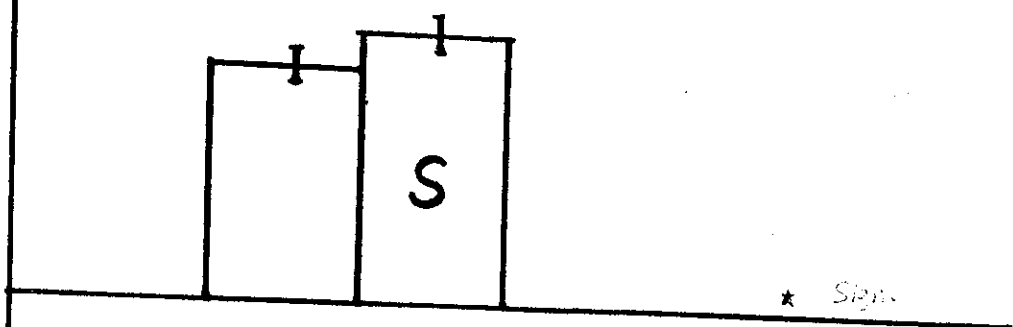
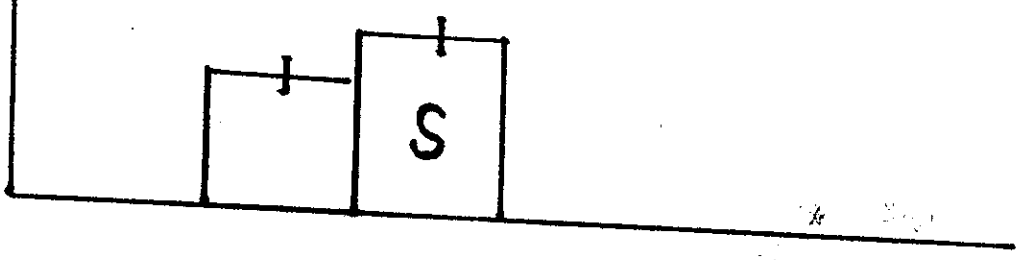


Fig (7)



(Table 12) A Comparison of serum Fer levels in smokers and nonsmokers in benign group before treatment

mean Serum Fer level in nonsmokers = 108.3 ng/ml
mean Serum Fer level in smokers = 129.5 ng/ml

The correlation is insignificant

(Table 13) A Comparison of serum Fer levels in smokers and nonsmokers in benign group during treatment

mean Serum Fer level in nonsmokers = 74.6 ng/ml
mean Serum Fer level in smokers = 87.8 ng/ml

The correlation is insignificant

(Table 14) A Comparison of serum Fer levels in smokers and nonsmokers in benign group after treatment

mean Serum Fer level in nonsmokers = 51.25 ng/ml
mean Serum Fer level in smokers = 52 ng/ml

The correlation is insignificant

Table (12)
A Comparison of serum Fer levels in smokers and nonsmokers in BENIGN group (before treatment)

	nonsmokers	smokers	Remarks
mean	108.3	129.5	P > 0.05
range	69.8 - 128.8	102.6 - 170.1	
size	10	10	
S.D.	24.8	17.6	insignificant
S.E.	7.8	5.57	
t		2.2	

Table (13)
A Comparison of serumc Fer levels in smokers and nonsmokers in BENIGN group (under treatment)

	nonsmokers	smokers	Remarks
mean	74.6	87.8	P> 0.05
range	49.2 - 102.3	67.6 - 109.3	
size	10	10	
S.D.	16.33	11	insignificant
S.E.	5.2	3.5	
t		2.1	

Table(14)
A Comparison of serumç Fer levels in smokers and nonsmokers in BENIGN group (after treatment)

	nonsmokers	smokers	Remarks
mean	51.25	52	P > 0.05
range	43.2 -68.6	40.2 - 66.1	
size	10	10	
S.D.	7.46	7	insignificant
S.E.	2.4	2.2	
t		0.23	

(Fig. 8) A Comparison of serum Fer levels in smokers and nonsmokers in benign group before treatment

mean Serum Fer level in nonsmokers = 108.3 ng/ml
mean Serum Fer level in smokers = 129.5 ng/ml

The correlation is insignificant

(Fig.9) A Comparison of serum Fer levels in smokers and nonsmokers in benign group during treatment

mean Serum Fer level in nonsmokers = 74.6 ng/ml
mean Serum Fer level in smokers = 87.8 ng/ml

The correlation is insignificant

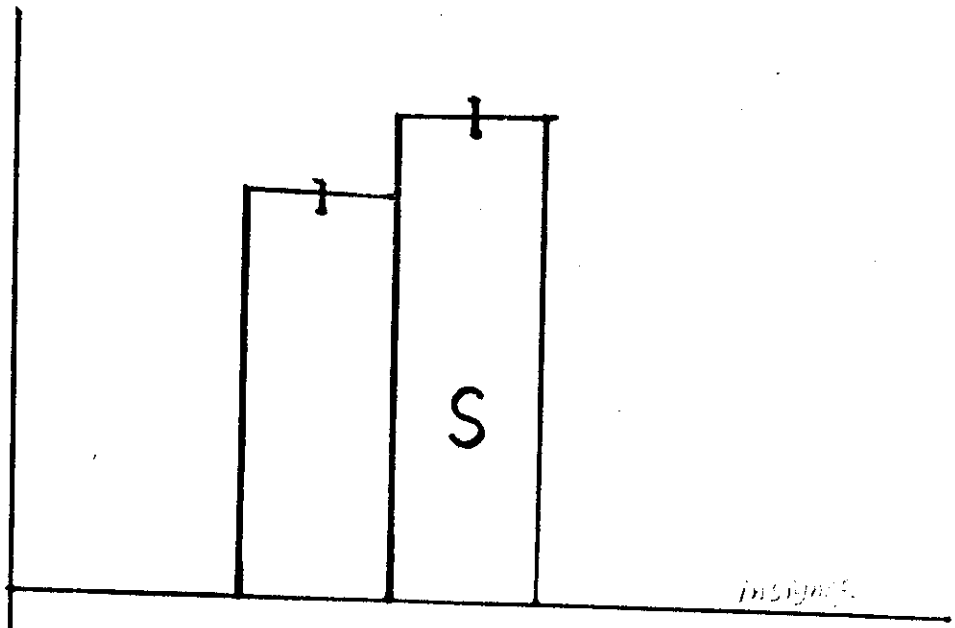
(Fig.10) A Comparison of serum Fer levels in smokers and nonsmokers in benign group after treatment

mean Serum Fer level in nonsmokers = 51.25 ng/ml
mean Serum Fer level in smokers = 52 ng/ml

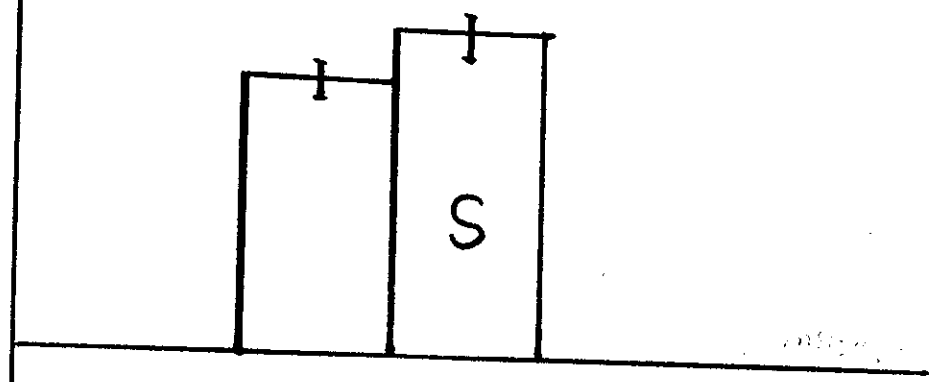
The correlation is insignificant

Fer

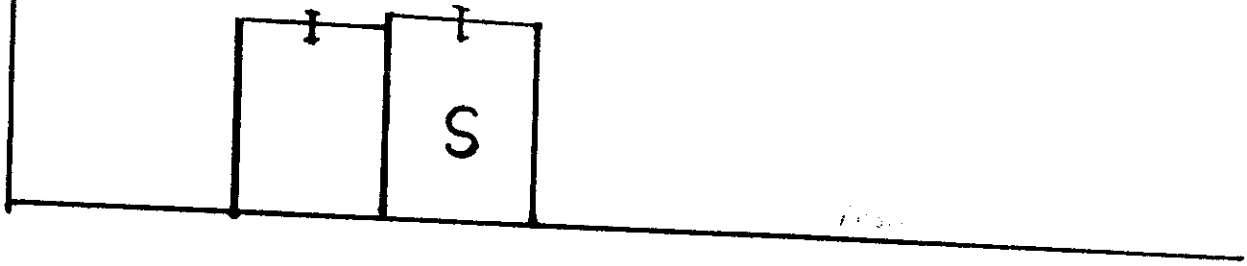
Fig (a)



Fig



Fig



(Table 15) Incidence of election of benign group (before treatment) at the cut. off level of control group

% of positive cases of CEA = 95%
% of positive case of Fer = 100%

(Table 16) Incidence of election of benign group (under treatment) at the cut- off level of control group

% of positive cases of CEA = 85 %
% of positive cases of Fer = 90 %

(Table 17) Incidence of election of benign group (after treatment) at the cut-off level of control group

% of positive cases of CEA = 15%
% of positive cases of Fer = 35%

Table (15)
Incidence of election of BENIGN LOSIONS (before treatment) at the cut- off level of control group

	CEA	Fer
control highest level	5.77	52.83
no. of benign lesions	20	20
no. of positive cases	19	20
% of positive cases at the cut. off level	95%	100%

Table (16)
Incidence of election of BENIGN LOSIONS (under treatment) at the cut- off level of control group

	CEA	Fer
control highest Level	5.77	52.83
no. of benign lesions	20	20
no. of positive cases	17	18
% of positive cases at the cut-off level	85%	90%

Table (17)
Incidence of election of BENIGN LOSIONS (after treatment) at the cut- off level of control group

	CEA	Fer
control highest level	5.77	52.83
no. of benign lesions	20	20
no. of positive cases	3	7
% of positive cases at the cut. off level	15 %	35 %

(Table 18) The anatomical distribution of benign lesions in head and neck showing their anatomical sites (in nose , thyroid, larynx, Salivary glands, mouth and ear), the number of cases in each site, serum CEA and Fer levels (before, during and after treatment) and their significance

The correlation here is insignificant

Table (18)
Anatomical distributions of BENIGN lesions

No.	anatanical sites	No. of cases	CEA			Fer		
			before treatment	under treatment	after treatment	before treatment	under treatment	after treatment
1	Nose	5	8.7	6.2	3.6	104.6	71.7	47.1
2	Thyroid	4	t2.45	6.8	4.46	135.3	93.3	54.9
3	Larynx	3	1t.2	6.6	4.2	121.4	84.4	50.7
4	Salivary glands	2	13.2	7.5	4.4	133.5	86.2	49.6
5	Mouth	4	9.2	6.2	4.4	93.0	64.2	52.
6	Ear	2	13.4	7.3	5.3	155.1	103.2	59.1

Insignificant

(Table 19) Malignant lesions of head and neck showing their type of the lesion, TNM classification, habit, age sex Serum CEA and Fer levels before treatment, during the cause of treatment and after the completion of treatment, their mean, S. D., S. E., t. and p.

Table (19) MALIGNANT tumours of head and neck

No	Type of the lesion	TNM Classif-ication	habit	age	Sex	CEA			Fer		
						before treatment	under treatment	after	before treatment	under treatment	after
1	Cancer hypopharynx Squamous cell carcinoma	T3N2M0	S	65	M	18.18	12.34	6.32	250.0	164.1	122.3
2	Cancer hypopharynx Squamous cell carcinoma	T3N2M1		60	F	22.39	11.15	7.93	232.6	152.7	125.5
3	Cancer hypopharynx Squamous cell carcinoma	T2N1M0	S	58	M	18.83	12.19	6.69	227.2	142.5	101.2
4	Cancer hypopharynx Squamous cell carcinoma	T3N2M1	S	62	M	20.21	12.24	8.43	240.8	173.2	119.7
5	Cancer larynx Squamous cell carcinoma.	T4N3M1	S	64	M	30.00	16.34	10.42	250.0	201.1	176.3
6	Cancer larynx Squamous cell carcinoma	T2N1M0		54	F	17.57	11.77	7.98	224.6	142.3	103.3
7	Post-cricoid carcinoma	T4N2M1	S	70	M	21.11	12.39	6.43	240.7	169.9	121.1
8	Post-cricoid carcinoma	T4N3M1		55	F	20.96	13.23	7.98	238.1	162.2	138.2
9	Carcinom of Rt orbit	T3N1M0		63	F	19.47	10.18	5.86	236.7	163.7	128.2
10	Carcinoma of Rt orbit	T32N1M0	S	70	M	20.30	11.96	6.91	243.3	175.5	106.6
11	Rodent ulcer Rt auricle	T1N0M0	S	30	M	18.72	11.12	5.39	190.8	138.2	83.2
12	Rodent ulcer lt auricle	T1N0M0		35	F	16.33	7.11	4.13	188.7	130.8	60.4
13	Rodent ulcer of the nose	T1N0M0		42	M	18.23	9.02	4.34	199.6	165.4	87.3
14	Rodent ulcer of the nose	T1N0M0		35	M	13.38	8.84	4.75	130.2	81.2	52.2
15	Cancer maxilla (Rt side)	T3N2M1		65	F	17.31	9.89	5.81	222.2	160.6	130.3
16	Cancer maxilla (Ltside)	T3N2M0	S	70	M	20.10	11.39	6.17	242.2	182.5	103.3
17	Carcinoma of Lt tonsil	T3N2M1	S	32	M	19.95	10.79	5.75	236.4	137.1	112.2
18	Carcinoma of Rt tonsil	T2N1M0		38	M	19.49	12.67	4.65	228.2	141.2	86.6
19	Cancer thyroid	T3N2M1	S	50	M	21.18	12.73	5.79	244.9	156.2	106.2
20	Cancer thyroid	T2N1M0		55	F	19.16	10.98	5.67	236.3	154.4	98.9
	mean					19.46	11.42	6.32	225.2	153.2	108.2
	S. D.					5.15	1.89	1.57	+ 27.87	+24.3	24.7
	S.E.					0.704	0.423	0.23	6.23	5.43	5.52
	T						-9.789	-16.704	+27.8	- 8.7	-5.8
	P						Sign.	Sign		Sign.	Sign.

(Table 20) A comparison between serum CEA levels in control, benign and maligmant groups (before, during and after treatment) showing the mean, range, size, standard deviation, standard error, t ,P., and significance

The correlation between groups is highly significant.

Table (20)

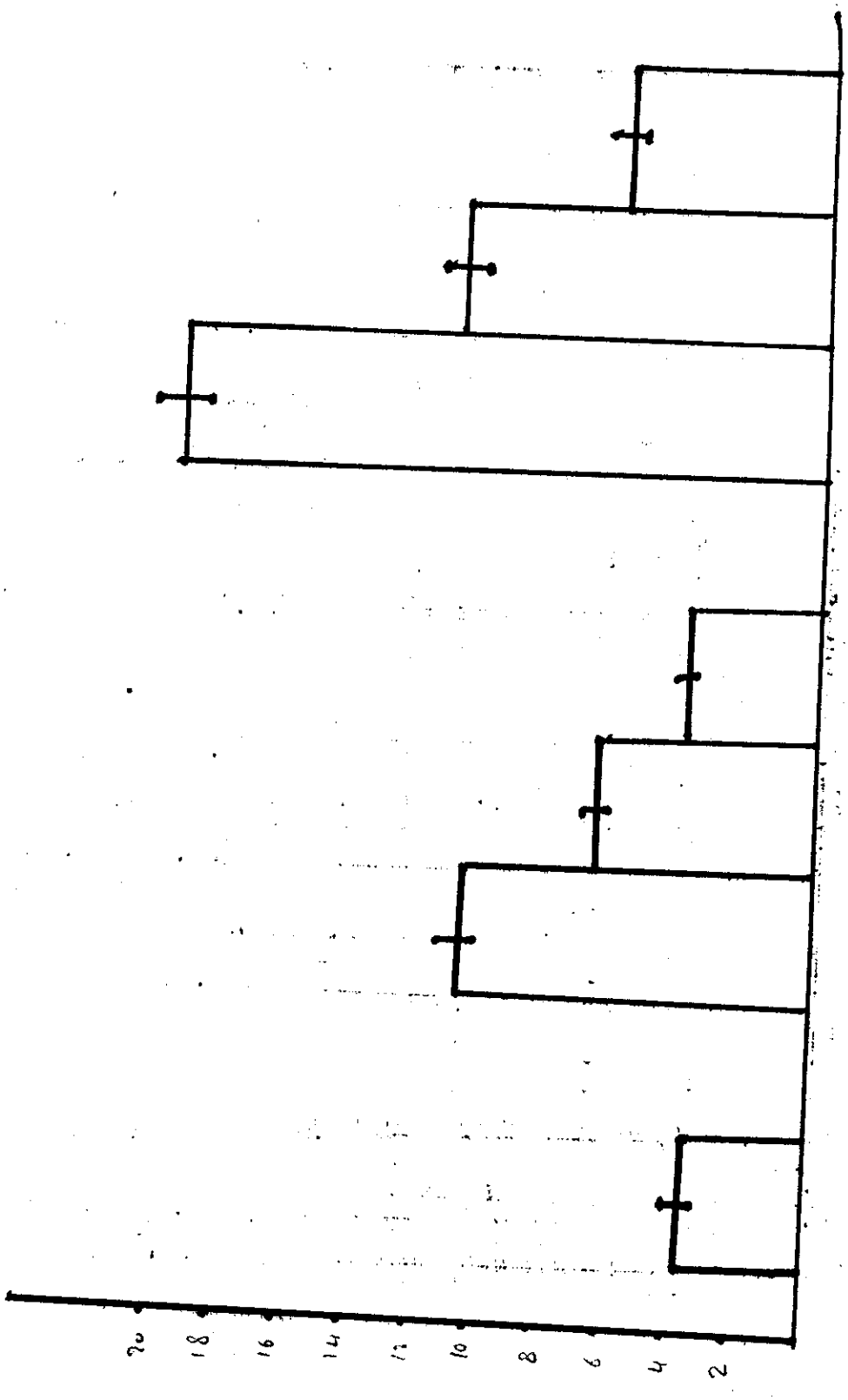
A Comparison of Serum CEA levels in CONTROL BENIGN, and MALIGNANT groups

	Control	benign			malignant		
		before treatment	under treatment	after treatment	before treatment	under treatment	after treatment
mean	3.72	10.83	6.66	4.05	19.46	11.41	6.32
range	0.0-5.77	5.0-13.67	3.57-8.1	1.56-5.98	13.31-30	7.11-16.11	4.13-103
size	20	20	20	20	20	20	20
S.D	± 1.6	± 2.38	± 1.09	± 1.25	± 5.15	± 1.9	1.6
S.E	0.36	0.53	0.24	0.28	0.7	0.4	0.35
T		17.5	-7.1	-11.2	18.5	- 9.8	-16.7
		P<0.01	P<0.01	P<0.01	P<0.01	P<0.01	P< 0.01
		** highly sign.	** highly sign.	** highly sign.	** highly sign.	** highly sign.	** highly sign.

(Fig. 11)

A Comparison between serum CEA levels in control, benign and malignant lesions

The correlation is highly significant


CGA
20
18
16
14
12
10
8
6
4
2

(Table 21) A comparison between serum Fer levels in control, benign
(before, under and after treatment) and malignant groups
(before, under and after treatment),showing there mean Range, size. S.D., S.E.,t,P and significance.

The correlation between groups is highly significant.

Table (21)
A Comparison of serum Fer levels in CONTROL BENIGN, and MALIGNANT groups

	Control	benign			malignant		
		before treatment	under treatment	after treatment	before treatment	under treatment	after treatment
mean	40.87	118.9	81.21	51.63	225.2	153.24	108.2
range	20.47-52.83	69.8-170.1	59.8-109.3	40.2-68.6	130.2-250	81.6-201.1	52.3-176.3
size	20	20	20	20	20	20	20
S.D.	+ 8.1	+ 23.98	+ 15.4	+ 7.3	+ 27.9	+24.3	+24.7
S.E	1.8	5.36	3.45	1.6	6.23	5.43	5.52
t		13.8	- 5.9	- 7.8	+ 27.8	- 8.7	- 5.8
		P<0.01	P<0.01	P<0.01	P<0.01	P<0.01	P<0.01
		**	**	**	**	**	**
		highly sign.	highly sign.	highly sign.	highly sign.	highly sign.	highly sign.

(Fig. 12)

A Comparison between serum FER levels in control, benign and malignant lesions

The correlation is highly significant

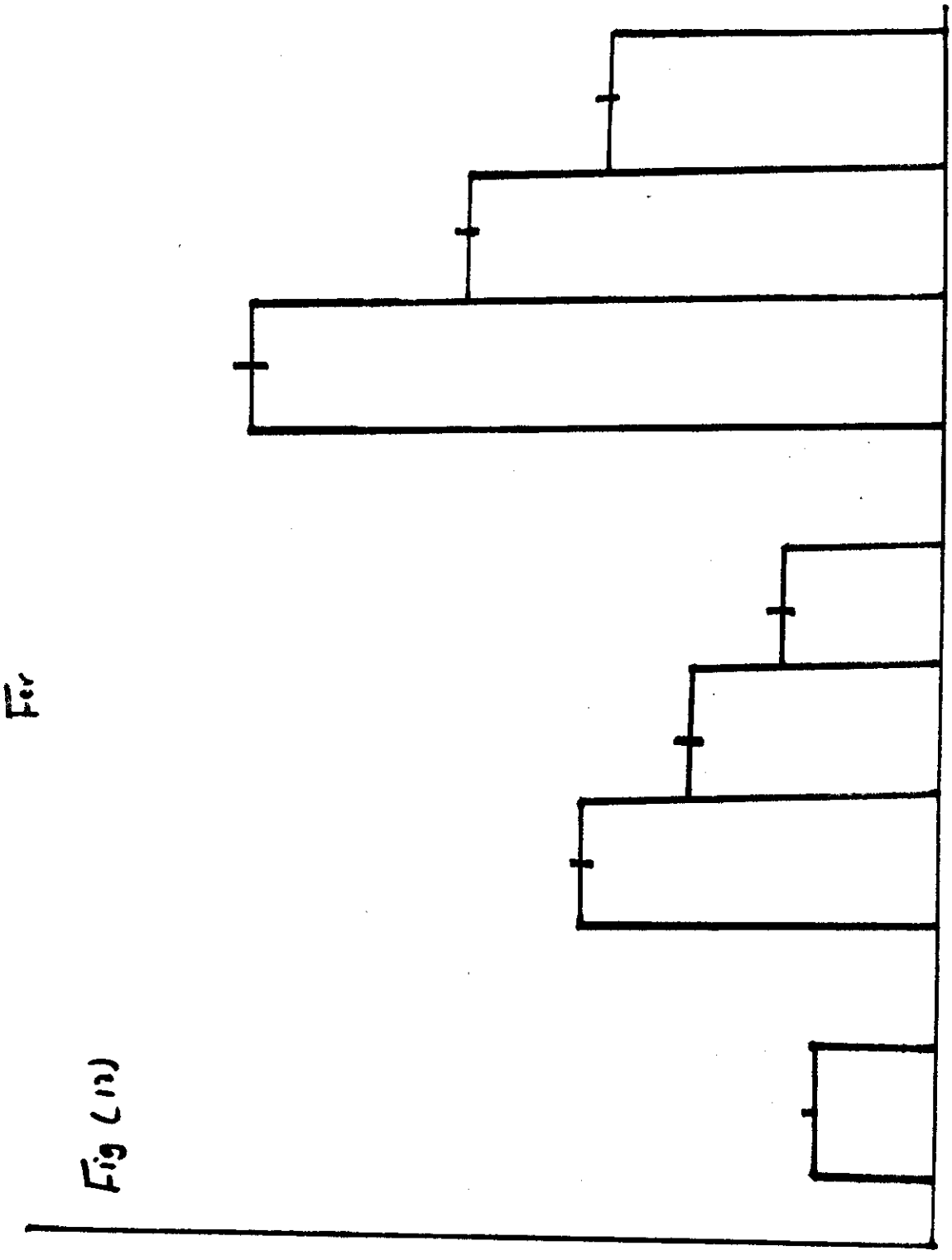


Fig (12)

(Table 22) A comparison of serum CEA levels in smokers and nonsmokers in malignant group (before treatment)

mean Serum CEA level in nonsmokers = 18.15 ng/ml
mean Serum CEA level in smokers = 21.14 ng/ml

The correlation is significant

(Table 23) A comparison of serum CEA levels in smokers and nonsmokers in malignant group Under treatment)

mean Serum CEA level in nonsmokers = 10.4 ng/ml
mean Serum CEA level in smokers = 12.4 ng/ml

The correlation is significant

(Table 24) A comparison of serum CEA levels in smokers and nonsmokers in malignant group (after treatment)

mean Serum CEA level in nonsmokers = 5.75 ng/ml
mean Serum CEA level in smokers = 6.84 ng/ml

The correlation is insignificant

Table (22)

A Comparison of serum CEA levels in smokers and nonsmokers in MALIGMANT group (before treatment)

	nonsmokcrs	Smokers	remarks
mean	18.15	21.14	P < 0.05
range	13.31- 22.39	18.72-30	
size	10	10	
S.D.	2.2	3.06	* Significant
S.E.	0.7	0.97	
t		2.5	

Table (23)

A Comparison of serum CEA levels in smokers and nonsmokers in MALIGMANT group (under treatment)

	nonsmokcrs	Smokers	Remarks
mean	10.4	12.4	P < 0.05
range	7.11- 12.67	10.79-16.11	* significant
size	10	10	
S.D.	1.6	1.4	
S.E	0.5	0.45	
T		2.98	

Table (24)

A Comparison of serum CEA levels in smokers and nonsmokers in MALIGMANT group (after treatment)

	nonsmokcrs	Smokers	Remarks
mean	5.75	6.84	P > 0.05
ramge	4.13-7.98	5.39-10.32	insignificant
size	10	10	
S.D	1.3	1.4	
S.E.	0.4	0.44	
T		1.48	

(Fig 13) A comparison of serum CEA levels in smokers and nonsmokers in malignant group (before treatment)

mean Serum CEA level in nonsmokers = 18.15 ng/ml
mean Serum CEA level in smokers = 21.14 ng/ml

The correlation is significant

(Fig. 14) A comparison of serum CEA levels in smokers and nonsmokers in malignant group Under treatment)

mean Serum CEA level in nonsmokers = 10.4 ng/ml
mean Serum CEA level in smokers = 12.4 ng/ml

The correlation is significant

(Fig.15) A comparison of serum CEA levels in smokers and nonsmokers in malignant group (after treatment)

mean Serum CEA level in nonsmokers = 5.75 ng/ml
mean Serum CEA level in smokers = 6.84 ng/ml

The correlation is insignificant

Fig (13)

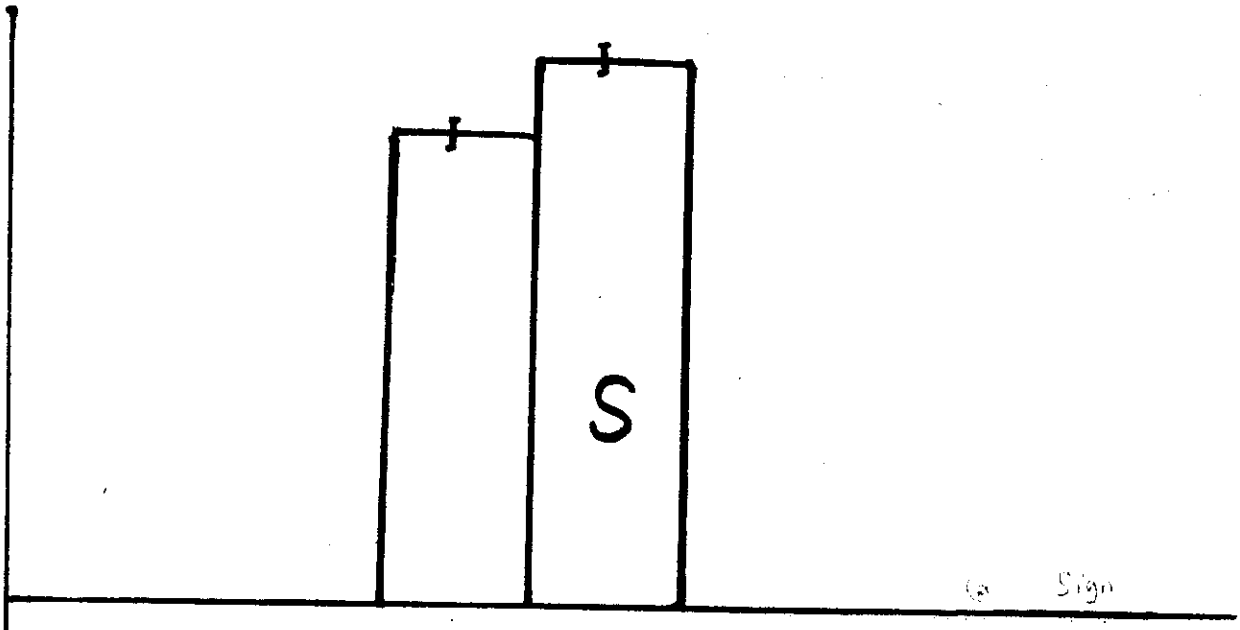


Fig (14)

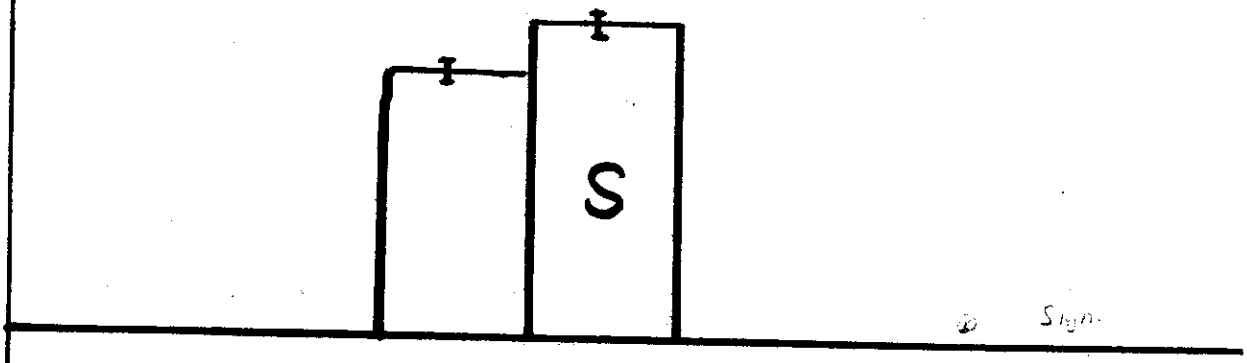
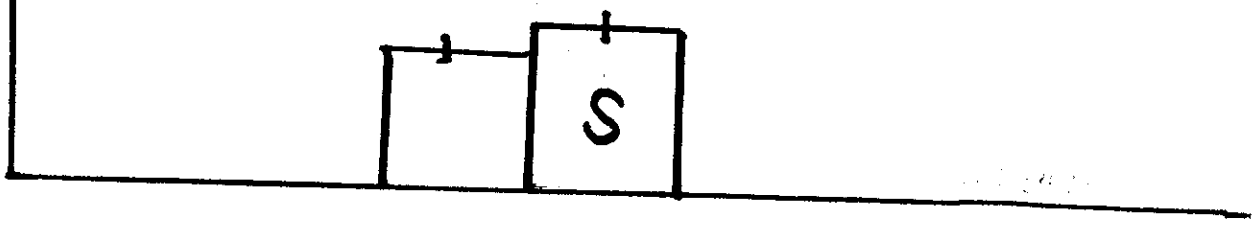


Fig (15)



(Table 25) A comparison of serum FER levels in nonsmokers and smokers in malignant group (before treatment)

mean Serum FER level in nonsmokers = 208.7 ng/ml
mean Serum FER level in smokers = 241.4 ng/ml

The correlation is highly significant

(Table 26) A comparison of serum FER levels in nonsmokers and smokers in malignant group (under treatment)

mean Serum FER level in nonsmokers = 141.9 ng/ml
mean Serum FER level in smokers = 164.7 ng/ml

The correlation is significant

(Table 27) A comparison of serum FER levels in nonsmokers and smokers in malignant group (after treatment)

mean Serum FER level in nonsmokers = 102.2 ng/ml
mean Serum FER level in smokers = 114.1 ng/ml

The correlation is insignificant

Table (25)
A Comparison of serum Fer levels in smokers and nonsmokers in **MALIGNANT** group (before treatment)

	nonsmokers	smokers	Remarks
mean	208.7	241.4	P< 0.01
range	130.2- 236.7	227.2- 250.0	**
size	10	10	highly significant
S.D.	31.3	6.3	
S.E.	9.9	2	
T		3.2	

Table (26)
A Comparison of serum Fer levels in smokers and nonsmokers in **MALIGNANT** group (under treatment)

	nonsmokers	smokers	Remarks
mean	141.9	164.7	P< 0.05
range	81.6 - 182.4	137.1-201.1	* significant
size	10	10	
S.D	25.1	16.9	
S.E	7.9	5.4	
T		2.4	

Table (27)
A Comparison of serum Fer levels in smokers and nonsmokers in **MALIGNANT** group (after treatment)

	nonsmokers	smokers	Remarks
mean	102.2	114.1	P> 0.05
range	52.3 - 138.2	86.2 - 176.3	
size	10	10	
S.D.	23.9	24	insignificant
S.E.	7.6	7.6	
t		1.1	

(Fig 16) A comparison of serum FER levels in nonsmokers and smokers in malignant group (before treatment)

mean Serum FER level in nonsmokers = 208.7 ng/ml
mean Serum FER level in smokers = 241.4 ng/ml

The correlation is highly significant

(Fig. 17) A comparison of serum FER levels in nonsmokers and smokers in malignant group (under treatment)

mean Serum FER level in nonsmokers = 141.9 ng/ml
mean Serum FER level in smokers = 164.7 ng/ml

The correlation is significant

(Fig. 18) A comparison of serum FER levels in nonsmokers and smokers in malignant group (after treatment)

mean Serum FER level in nonsmokers = 102.2 ng/ml
mean Serum FER level in smokers = 114.1 ng/ml

The correlation is insignificant

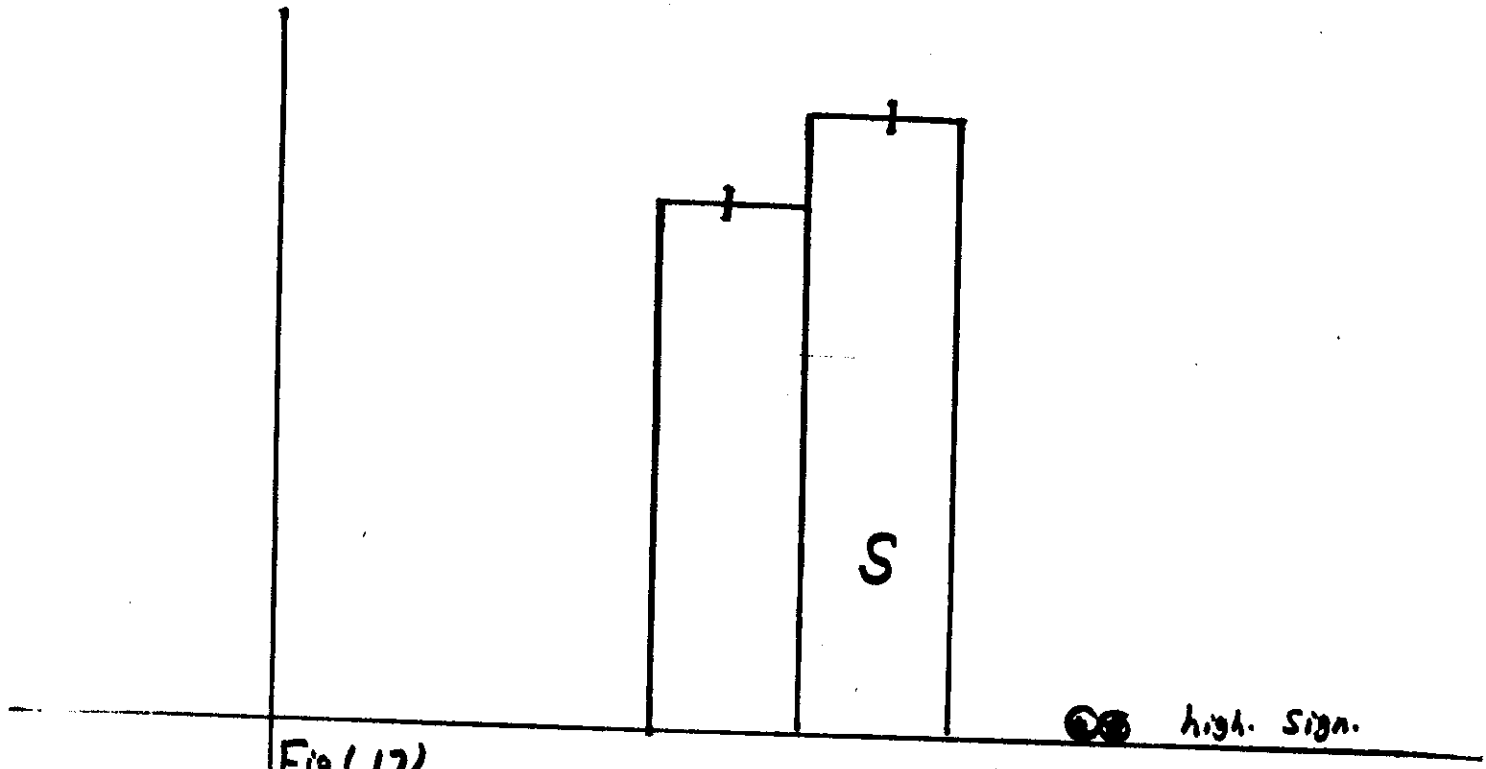


Fig (17)

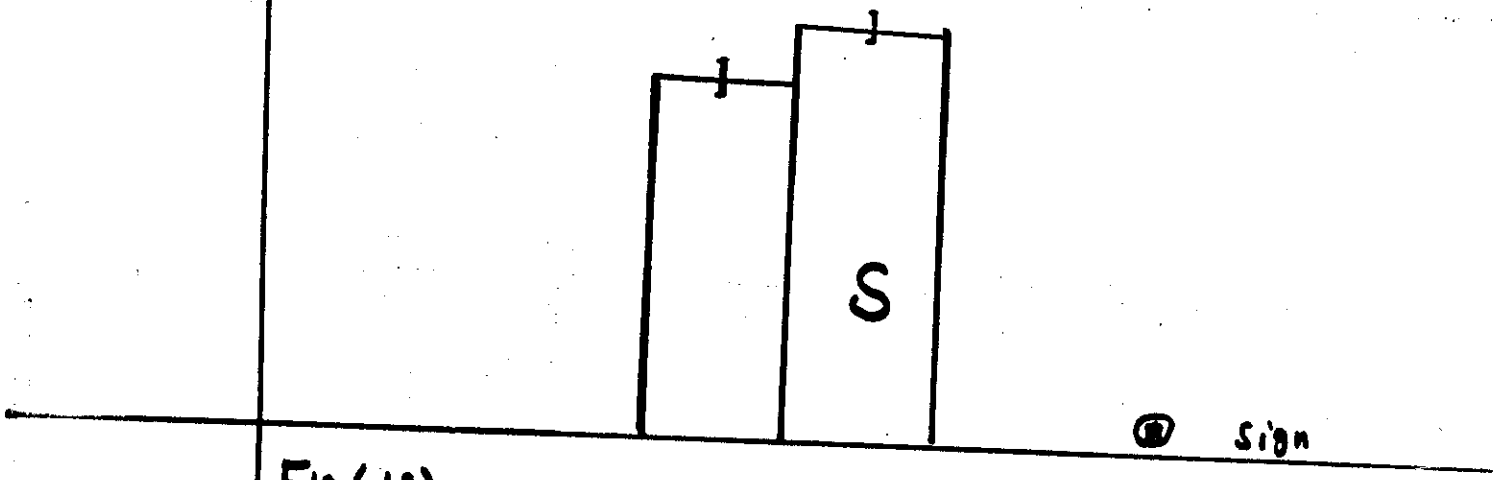
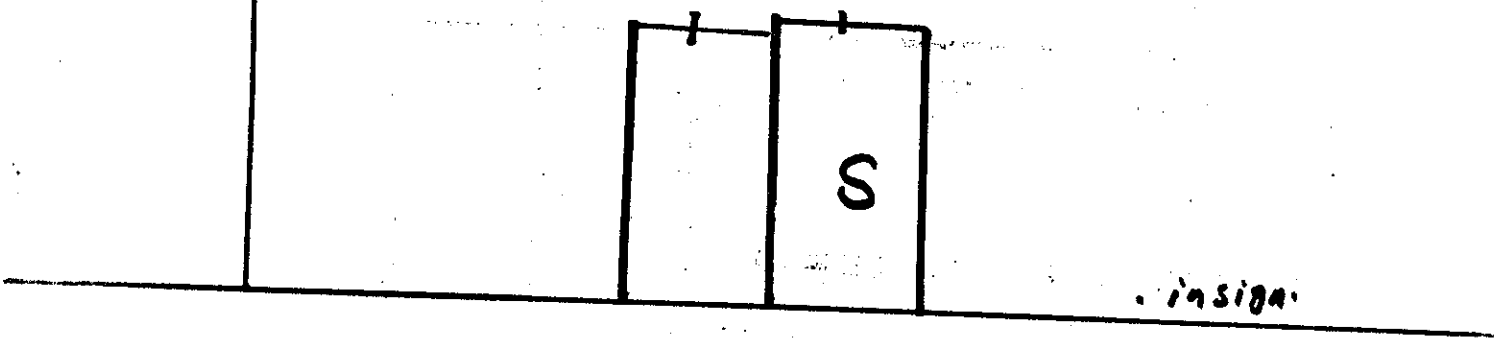


Fig (18)



(Table 28) The anatomical distribution of malignant lesions showing the anatomical sites (in hypopharynx, larynx, orbit auricle, nose,maxilla, tonsil, and thyroid), number of cases, their serum CEA and Fer levels (Before, under and after treatment) and their significance

The correlation here is insignificant.

Table (28)

Anatomical distributions of MALIGNANT lesions

No.	anatamical sites	No. of cases	CEA			Fer		
			before treatment	under treatment	after treatment	before treatment	under treatment	after treatment
1	Hypopharynx	4	22.86	12.92	8.34	237.6	158.1	117.2
2	Larynx	4	19.46	12.43	6.85	220.3	162.9	132.2
3	Orbit	2	19.89	11.07	6.39	240	169.6	95
4	Auricle	2	17.53	10.5	5.6	213.4	146.5	99.3
5	Nose	2	17.81	8.93	4.5	223.4	156.3	116.75
6	Maxilla	2	16.7	9.3	5.2	186.2	123.6	69.8
7	Tonsil	2	19.7	11.7	5.3	232.3	139.2	103.4
8	Thyroid	2	20.2	11.8	5.7	240.6	155.3	92.5

Insignificant

(Table 29) Incidence of election of malignant lesion (before treatment)at the cut-off level of control group

% of positive cases of CEA = 100 %
% of positive cases of Fer = 100 %

(Table 30) Incidence of election of malignant lesions (under treatment) at the cut-off level of control group

% of positive cases of CEA = 100 %
% of positive cases of Fer = 100 %

(Table 31) Incidence of election of malignant lesions (after treatment) at the cut--off level of control group

% of positive cases of CEA = 65 %
% of positive cases of Fer = 95 %

Table (29)
Incidence of election of MALIGNANT lesions (before treatment) at the cut-off level of control group

	CEA	Fer
Control highest level	5.77	52.83
no. of malignant lesions	20	20
no. of positive cases	20	20
% of positive cases at the cut-off level	100 %	100 %

Table (30)
Incidence of election of MALIGNANT lesions (under treatment) at the cut-off level of control group

	CEA	Fer
Control highest level	5.77	52.83
no. of malignant lesions	20	20
no. of positive cases	20	20
% of positive cases at the cut-off level	100 %	100 %

Table (31)
Incidence of election of MALIGNANT lesions(after treatment) at the cut-off level of control group

	CEA	Fer
Control highest level	5.77	52.83
no. of malignant lesions	20	20
no. of positive cases	13	19
% of positive cases at the cut-off level	65%	95%

(Table 32) Incidence of election of malignant lesions (before treatment) at the cut-off level of benign group (before treatment)

% of positive cases of CEA = 95 %
% of positive cases of Fer = 95 %

(Table 33) Incidence of election of malignant group (under treatment) at the cut-off level of benign group(under treatment)

% of positive cases of CEA = 95 %
% of positive cases of Fer = 95 %

(Table 34) Incidence of election of malignant group(after treatment) at the cut-off level of benign group (after treatment)

% of positive cases of CEA = 50 %
% of positive cases of Fer = 95 %

Table (32)
Incidence of election of MALIGNANT lesions at the cut-off level of BENIGN group
(before treatment)

	CEA	Fer
Benign highest level	13.67	170.1
no. of malignant cases	20	20
no. of positive cases	19	19
% of positive cases at the cut-off level	95%	95%

Table (33)
Incidence of election of MALIGNANT group lesions at the cut-off level of BENIGN group
(under treatment)

	CEA	Fer
Benign highest level	8.1	109.3
no. of malignant cases	20	20
no. of positive cases	19	19
% of positive cases at the cut-off level	95%	95%

Table (34)
Incidence of election of MALIGNANT lesions at the cut-off level of BENIGN group
(after treatment)

	CEA	Fer
Benign highest level	5.98	68.6
no. of malignant cases	20	20
no. of positive cases	10	19
% of positive cases at the cut -off level	50%	95%