

The Impact of Endoscopy Training During Residency on the Diagnostic

Asistanlık Süresinde Alınan Endoskopi Eğitiminin Tanı Üzerine etkisi

Asistanlık Boyunca Endoskopi Eğitimi / Endoscopy Training During Residency

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Özet

Amaç: Cerrahların asistanlığı süresince endoskopi eğitimi almış olmasının, endoskopik tanı üzerine etkisini değerlendirmeyi amaçladık. Gereç ve Yöntem: Cerrahi Endoskopi Ünitesin de 2009-2011 tarihleri arasında endoskopi yapılan hastalara ait dosyalar retrospektif olarak incelendi. Endoskopistler asistanlığı süresince endoskopi eğitimi alanlar (Grup I) ve almayanlar (Grup II) olarak ayırıldı. Endoskopik tanıyı doğrulama yöntemi olarak biyopsi sonucu kabul edildi. Endoskopi sonuçları ile biyopsi sonuçları karşılaştırılarak endoskopistin tanı koymadaki tutarlılığı hesaplandı. Bulgular: Üç yıllık süre içinde 9055 hastaya endoskopi işlemi yapılmış, 1285 (%14) hastadan biyopsi alınmıştı. Hastaların yaş ortalaması 54 (15-94) idi. 15 genel cerrahi uzmanından 8 tanesi grup I' de, 7 taneside grup II' de idi. Grup I ve Grup II endoskopistlerin tanıları ile alınan biyopsi sonuçları karşılaştırıldı. Üst GİS endoskopi işleminde grup I endoskopistler %79 tutarlılık gösterirken grup II endoskopistler %72 tutarlılık göstermiş olup fark anlamlı idi (P=0.035). Alt GİS endoskopi işleminde ise Grup I %79 tutarlılık gösterirken Grup II %80 tutarlılık göstermiş olup fark anlamlı değil idi (P=0.709). Tartışma: Endoskopi yapan cerrahların asistanlığı süresince endoskopi eğitimi alarak yetişmeleri üst GİS lezyonlarını doğru tanıma üzerine olumlu katkı sağlamıştır.

Anahtar Kelimeler

Endoskopi; Asistanlık; Tanı

Abstract

Aim: The aim of the study is to evaluate the impact of endoscopy training during residency on endoscopic diagnosis. Material and Method: the patients files who had undergone endoscopy between 2009 and 2011 in surgical endoscopy unit, retrospectively evaluated. Endoscopists were divided into 2 groups as endoscopy training during residency (group 1) or than after (group 2). Histopathological evaluation was accepted as the method to confirm the diagnosis. Endoscopic and pathological diagnoses were compared and the consistencies of the Endoscopists were calculated. Results: There were 9055 endoscopic evaluation and 1285 biopsies were taken in 3 years period. The mean age of the patients were 54 (15-94). There were 15 surgeons, 8 in group 1, 7 in group 2. In upper gastrointestinal system endoscopy the consistency rates were 79% in group 1 and 72% in group 2 (p=0,035). In lower gastrointestinal system endoscopy, the consistency rates were 79% in group 1 and 80% in group 2 (p=0,709). Discussion: Endoscopy training during residency has positive impact on identification of upper gastrointestinal system lesions.

Keywords

Endoscopy; Residency; Diagnosis

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Introduction

Following the developments occurred in the last century, the endoscopy technology which became a gold standard for diagnose of Gastro Intestinal System (GIS) cancer, acquired an essential place in the surgery [1]. Especially the scanning programs developed for the colon cancers and the positive results obtained from surgery after early diagnosis of gastric and colon cancers, leaded to increase in the yearly number of endoscopies [1-4]. With the insufficient number of gastroenterologists and the surgeons who wanted to evaluate by themselves the GIS structure to be operated, there urged the necessity of performing the endoscopy by the surgeons [5].

Many of General Surgery Clinics from University Hospitals and Training Hospitals installed endoscopy units within their structures and gained endoscopy making abilities to the surgery assistants trained by them [1]. The general surgery specialists who were trained in the surgery clinics unfurnished with endoscopy units by receiving specialization training, tried to cover these necessities by taking certificates from the courses organized by the specialization associations [4-5]. The correct diagnosis of GIS pathologies due to abilities of the surgeons gained either during their internship or after specialization is therefore important for the continuity of the rights earned [4].

The evaluation of match of the endoscopic diagnose with the pathological one, is an objective evaluation method to reveal the sufficiency of diagnose for the endoscopies performed by the surgeons [4]. In our study we tried to determine whether or not there is any difference in terms of a consistent endoscopic diagnosis between those who received their endoscopic training during their internship and those who received after their specialization.

Material and Method

The information belonging to the patients who undergone diagnostic endoscopy between January 2009 and December 2011 in the general surgery endoscopy unit of Konya Training and Research Hospital were obtained retrospectively from the patient files and hospital automation. The information of the general surgery specialists who performed the endoscopy operations were retrieved from personnel files. They were grouped as those with endoscopy unit in the general surgery clinic where they made their internship (Group I) and those who received the endoscopy training after their specializations by attending the certification courses organized by the specialization associations (Group II).

Patients

It has been understood that "open access" request was made without implying any restriction while requesting endoscopy from the patient with digestive system complaints. Endoscopy was performed to each of patient, except those with conditions leading to contraindication for endoscopy and those who didn't give written consent for the procedure.

The patient who undergone biopsy due to the GIS mucosa anomaly during the endoscopy were included to study and those who did not undergone biopsy because their mucosa structure was normal, were excluded.

Upper GIS endoscopy was performed with video endoscope (EG:459WR5; Fuji Photo Optical Co. Ltd. Satiama, Japan) after faringeal xylocaine spray topical anesthesia following eight hours fasting. Reaching the 2nd section of the duodenum by passing the stomach after the mouth, was considered sufficient for the procedure. Biopsy of the patients evaluated with normal mucosa during the routine exam of the esophagus, stomach and duodenum, wasn't taken. In average 7 biopsies were taken from the mucosal surfaces considered as presenting an abnormal view. The biopsies taken were sent to the pathology laboratory within 10% formol solution. Gimsa staining was performed in order to evaluate the Hematoxylene- Eosin and H. Pylori status for histopathology investigation.

Lower GIS endoscopy procedure; the patient were feed with pulpless liquid foods starting 48 hrs before and the day before the procedure, in the morning between 9 and 12 and in the evening between 20 and 23 they drunk 45 ml Sodium phosphate solution mixed with 1 lt. of water or juice. Also the intestines of the patient were cleaned by performing 135 ml Sodium phosphate clyster rectally, in the morning one day before the procedure and also in the morning of the procedure day. The patients were screened in terms of blood pressure, pulse and O2 saturation before the procedure. After reaching from anal channel with video endoscope (IC:340A054; fuji Photo Optical Co. Ltd. Satiama, Japan), and it was seen that the intestine cleaning is sufficient, midazolam 0.1 mg / kg IV for sedation and meperidine 0.3 mg/kg IV for analgesic purposes were applied and it has been reached till the cecum. The biopsy of the patients with normal mucosa wasn't taken and from those with abnormal evaluations the biopsy was taken. Polypectomy was performed to those who had polypes which may be extracted with polypectomy and the biopsy samples taken were sent to pathology laboratory within 10% formol solution.

We have grouped the endoscopic diagnostics and the histopathology diagnostics obtained as a result of biopsy in five groups in order to ensure easiness in terms of statistical calculation and comparison.

The findings necessitating the biopsy at the upper GIS endoscopy were classified as: 1. The alterations and ulcers defined as benign in the gastrointestinal mucosa, 2. Gastritis, 3. Anastomosis line belonging to the previous surgeries, 4. Ulcers, polypes and adenomas defined as premalign, 5. Cancers. The upper GIS endoscopy biopsy analysis results were classified as: 1. Normal gastro intestinal system (GIS) cells and ulcer surface, 2. Gastritis, 3. Granulation tissue, 4. Atypic hyperplasia, intestinal metaplasia, dysplasia, 5. Cancers.

The findings necessitating the biopsy at the lower GIS endoscopy were classified as: 1. Benign polyploidy lesions (non precancerous inflammatory polype, hamartoma polype, hyperplastic polype, solitary rectal ulcer) and mucosa variations, 2. Nonspecific pus intestine disease (colitis-proctitis), 3. Inflammatory intestine disease (Crohn, Colitis with ulcer), 4. Adenoma and polypoid lesions (lesions considered precancerous as tubulovillous adenoma and villous adenoma), 5. Cancers. The lower GIS endoscopic biopsy analysis results were classified as: 1. Normal mucosal structure and benign polypoid lesions, 2. Nonspecific colitis, 3. Ulcerative colitis, Crohn (histopathology consistent with inflammatory intestine disease), 4. Precancerous lesions and dysplasia, 5. Cancers.

The final diagnostic was obtained by histopathology analysis of the biopsy material. In cases in which the endoscopic diagnosis was consistent with the histopathology diagnosis, the diagnostic of endoscopy procedure was evaluated as consistent / proper.

In our study the consistency of endoscopic diagnostic of the Group I endoscopist general surgeons and the consistency of endoscopic diagnostic of the Group II endoscopist general surgeons were compared. Furthermore, the both groups' GIS cancers sensitivity and specificity to diagnostic were evaluated.

In the evaluation of the findings obtained in our study, the sensitivity, specificity, positive predictive value, negative predictive value and total accuracy were calculated. SPSS Statistics Version 20 was used for statistical operations. Chi-square test was carried out during the analyses. P<0.05 value was accepted as significant.

Results

Diagnostic GIS endoscopy was performed to 9055 patients by 15 endoscopist general surgery specialist within a period of three years between January 2009 and December 2011, in the general surgery endoscopy unit of Konya Training and Research Hospital; biopsy was taken from 1285 (14,19%) patients and 73 cancers (0,80%) were determined (Table 1).

Table 1. Total endoscopies done by general surgeons and the amaount of diagnosed GIS cancer.

			Grup I	Grup II	Total
Upper GIS endoscopy	Endoscopy	n	3924	1797	5721
		%	68,72	31,28	100
	Biopsy taken	n	605	293	898
		%	67,38	32,62	100
	Diagnosed cancer	n	15	14	29
		%	51,73	48,27	100
Lower GIS endoscopy	Endoscopy	n	2061	1273	3334
		%	61,82	38,18	100
	Biopsy taken	n	226	161	387
		%	58,40	41,60	100
	Diagnosed cancer	n	26	18	44
		%	59,10	40,90	100
Upper and Lower GIS endoscopy together	Endoscopy	n	5985	3070	9055
		%	66,10	33,90	100
	Biopsy taken	n	831	454	1285
		%	66,65	33,35	100
	Diagnosed cancer	n	41	32	73
		%	56,17	43,83	100

Eight surgeons (Group I) from 15 general specialist surgeons who carried out the endoscopic procedure received their trainings during their internship and 7 surgeons (Group II) from certification courses organized by the specialization association and / or from endoscopy training centers after they became a general surgeon.

The age average of 1285 patients who are included in our study group (from whom biopsy was taken during the endoscopy) was 54 (15-94). 632 (49%) of those patients were women and 653 (51%) men. The most frequently diagnosed finding at upper GIS endoscopy was gastritis ,664 (74%). Similarly the most frequently determined histopathology finding in the biopsy results was gastritis, 743 (83%) (Table 2). The most frequently diagnosed finding at the lower GIS endoscopy was polype, 233 (60%) and also the polypes are the most frequently determined histopathology diagnostic of the biopsy results, 217 (56%) (Table 3).

Table 2. Endoscopic findings and biopsy results of Upper GIS endoscopies done by general surgeons

	Endoscopic Findings		Histopathological findings	
	n	%	n	%
Gastric Ulcer	100	11,14	57	6,35
Gastritis	664	73,94	743	82,74
Anastomosis line belong to previous surgery	23	2,56	10	1,11
Polyp, Adenoma (precancerous lesions)	54	6,01	59	6,57
Cancer	57	6,35	29	3,23
Total	898	100	898	100

Table 3. Endoscopic findings and biopsy results of Lower GIS endoscopies done by general surgeons

	Endoscopic Findings		Histopathological findings	
	n	%	n	%
Normal Mucosa	11	2,84	14	3,62
inflammatory bowel disease (Nonspecific Kolitis)	75	19,34	110	28,42
chronic granulomatous disease (ulcerative colitis, chron disease)	6	1,60	2	0,52
Polyp, Adenoma (precancerous lesions)	233	60,20	217	56,07
Cancer	62	16,02	44	11,37
Total	387	100	387	100

H. Pylori was investigated at 743 (83%) of 898 patients from whom biopsy was taken due to the abnormalities discovered in the stomach mucosa during the upper GIP endoscopy; 400 (54%) negative and 373 (46%) positive. The histopathology diagnostic of those with positive H. Pylori was gastritis for 326 (87%), gastric ulcer for 9 (2,4%) and gastric polype for 8 (2,1%) patients.

The sensitivity of GIS cancer diagnosis with endoscopy procedure of endoscopist general surgeons was determined as 92%, the specificity as 96%, the positive predictive value as 56%, the negative predictive value as 99% and the total accuracy value as 95%. When Group I was compared with Group II, the sensitivity of the both groups in terms of diagnosing the GIS cancer was similar (Table 4).

As a result of the comparison of diagnostic obtained from the histopathology investigation of the biopsy material taken by the endoscopist general surgeons with by GIS endoscopy with the endoscopic diagnostics, the consistency of endsocopists from Group I was 79 % while the consistency of endoscopists from Group II was 76%, so there wasn't any significant difference between the two groups (P=0.148). The results of biopsies taken with upper GIS and lower GIS endoscopic diagnostics by

Table 4. Sensitivity of Cancer spotting on the GIS endoscopies done by general surgeons.

	Sensitivity %	specifity %	positive predictive value %	negative predictive value %	Total Truth value %
Toplam GİS (Üst ve Alt GİS) Endoskopisi	92	96	56	99	95
Üst GİS Endoskopisi Total	93	96	47	99	96
Üst GİS Endoskopisi Grup I	93	97	46	99	97
Üst GİS Endoskopisi Grup II	93	95	48	99	95

Group I and respectively Group II endoscopists were compared separately. While Group I endoscopists exhibited a consistency of 79% at the upper GIS endoscopy procedure, the consistency of Group II endoscopists was 72% and there was a significant difference (P=0.035). While Group I endsocopists exhibited a consistency of 79% in at the lower GIS endoscopy procedure, the consistency of Group II endoscopists was 80% and there wasn't any significant difference (P=0.709) (Table 5).

Table 5. The comparison of the diagnostic accuracy of group 1 and group 2 surgeons

			Group I	Group II	Total	P	
Upper GIS endoscopy Coherent		n	478	213	691	0.035	
		%	79,0	72,7	76,9		
	Not coherent	n	127	80	207		
		%	21,0	27,3	23,1		
	Total	n	605	293	898		
		%	100	100	100		
Lower GIS endoscopy	Coherent	n	179	130	309	0.709	
		%	79,2	80,7	79,8		
	Not coherent	n	47	31	78		
		%	20,8	19,3	20,2		
	Total	n	226	161	387		
		%	100	100	100		
Upper and Lower GIS endoscopy together	Coherent	n	657	343	1000	0.148	
		%	79,1	75,6	77,8		
	Not coherent	n	174	111	285		
		%	20,9	24,4	22,2		
	Total	n	831	454	1285		
		%	100	100	100		

Discussion

Endoscopy is a Greek word which derived from words "Endo" which means inside and "Skopein" which means see; basically it means the ability of seeing inside the body by means of small cameras attached to rigid and flexible tubes [6]. The endoscopy procedure and surgical interventions made by intrusion from natural openings have increased the attentions of surgeons to endoscopy [1,4]. Following the usage of the first fiber optic endoscopy in 1957 for GIS investigation, the endsocopist surgeon William S. Mc Cune made ERCP in 1968. Yaumans and colleagues who were surgeon stopped in 1969 the gastric bleeding by means of endoscopic intervention and in 1979 the surgeons placed the first PEG [6-9]. In our country the surgeons showed increased interest to endoscopy in the last 40 years [1]. The endoscopy units were opened by surgeons in the period of non availability of the gastroenterology specialists and diagnostic, invasive endoscopic procedures as well as publications were made in this field [10, 11].

Endoscopy is a gold standard to determine the pathologies and cancers from GIS [2,12]. The abilities and experiences of endoscopists performing the endoscopy procedure are important in diagnosing the benign and malign lesions from GIS. Endoscopy is an invasive procedure and has important complications such as perforation, bleeding and infection during the application. For an accurate endoscopic application and minimum complications of the endoscopic procedure, the endoscopist has to undergo a training process and to acquire the minimum experience. In the endoscopy units of the University Hospitals and some Training and Research hospitals, the gastroenterologists and gastroenterology surgeons are providing the interns (as of their 2nd year) and specialists (as post specialization training course) with endoscopy training [1,4,5].

The Turkish Surgery Association's Endoscopy Certification Program considers as sufficient minimum 50 lower and 75 upper GIS endoscopies to be performed by attendants. When scanning the literature this number is 125-300 for upper GIS endoscopy and 100-200 for lower GIS endoscopy. In the guidelines of American Society for Gastrointestinal Endoscopy –ASGE 130 gastroscopy are suggested for upper GIS endoscopy and 140 colonoscopy for lower GIS endoscopy [1,5].

The World Gastroenterology Association has determined the gastroenterologist necessity for one hundred thousand populations as 1-2. This ratio is 0.62 % per thousand [5]. The increase in the number of endoscopies, the insufficiency of the available gastroenterologists brought up the carrying out of endoscopy procedure by internists and specialist surgeons who received endoscopy training. In countries such as America and England it was shown that this procedure may be carried out safely not only by the physicians but by the nurses and health personnel provided that they are properly trained. Many studies revealed that surgeons are able to perform the endoscopy procedure with the same or lower levels of mortality and morbidity with the gastroenterologists [1,13]. In our hospital the endoscopy procedure is performed by gastroenterologists and surgeons.

We tried to determine whether those receiving the endoscopy training during their internship and those receiving after they become specialists are diagnosing accurately or not the abnormal endoscopic findings. We admitted the technical abilities of the both groups' surgery endoscopists as sufficient. While in all the endoscopy procedure Group I endoscopist exhibited a consistency of 79% the consistency of Group II endoscopists was 76%. The difference of comparison between the group wasn't significant (P=0.148). While for the upper GIS endoscopy procedure the consistency of Group I was 79%, the Group II exhibited a consistency of 72% and therefore the difference was significant (P=0.035). While for the lower GIS endoscopy procedure the consistency of Group I was 79%, the Group II exhibited a consistency of 80% and therefore the difference wasn't significant (P=0.709). The results of comparison were consistent with

the literature ratios of 68-80% [1,13-15]. The inconsistency exhibited by Group II in the upper GIS endoscopic findings results from differences of diagnosing the benign lesions from stomach mucosa because while gastritis was diagnosed in 74% of the patients as endoscopic finding, 83% gastritis was determined as a result of biopsy. While gastric ulcer was diagnosed at 11,4% of the patients as endoscopic finding, 6,35% gastric ulcer was determined as a result of biopsy.

The primary objective in the endoscopy procedures is the accurate and early diagnostic of GIS cancers. The sensitivity of cancer diagnostic by means of endoscopy by the endoscopist general surgeons was 92%, the specificity 96%, the positive predictive value 56%, the negative predictive value 99% and the total accuracy value 95%. When comparing the Group I with Group II, the sensitivity of the both groups regarding the GIS cancer diagnosis was similar (Table 4). It was also consistent with the values defined in the literature [4].

It is possible to evaluate the alterations from the gastric mucosa pattern by upper GIS endoscopy and its association with H. Pylori by means of the biopsy taken. The ratio of seeing H. Pylori if any, by means of a properly performed stomach biopsy is almost 100%. The sensitivity of the endoscopes with high resolution is quite high in defining the stomach mucosa abnormalities and determining the H. Pylori positive mucosal pattern [16-18]. The mucosa structure normally seen endoscopically, is normal also as histopathologically. If there are any inflammatory cells in the mucosa structure this is frequently due to the H. Pylori [19]. While in the advanced countries the prevalence of H. Pylori gastritis is 30%, this ratio increases up to 90% in the less advanced counties [19]. In our study H. Pylori was investigated in 83% of 898 patients who undergone upper GIS endoscopy and 43% was found positive. H. Pylori was determined positive in 326 (44%) of 743 patients diagnosed with gastritis as a result of biopsy and 9 (16%) of 57 patients diagnosed with stomach ulcer.

Conclusions

1- The raising of endoscopist surgeons by receiving endoscopy training during their internship ensured a positive contribution on the accurate diagnostic of upper GIS lesions.

2- The endoscopy training shall be included in the core training programs of General Surgery. The establishments which do not have proper opportunities shall ensure that their interns are receiving endoscopy training by means of rotation.

Competing interests

The authors declare that they have no competing interests.

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